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ABSTRACT

The purpose of this report is to provide a common framework within which Ohio's public institutions of higher education can perform their existing planning, programming, and budgeting functions. The purposes, organization, and outputs of higher education are discussed in the first 3 sections. Purposes include: instructional objectives, research, public service, auxiliary services to students, and student financial assistance. Organization for utilization of resources may involve 3 levels of management: operations, program, and enterprise management. The outputs can be determined in ways appropriate to the particular category of effort undertaken and services provided. The next 2 sections discuss: (1) planning the objectives of higher education which requires following a set number of procedures; and (2) programming the output of higher education, including instructional programming, programming for the Associate Degree, the BA degree, graduate professional instruction, graduate instruction, research, public service, auxiliary services, and student aid. The last 4 sections deal with: (1) budgeting the inputs for current operations; (2) planning capital improvements; (3) programming capital improvements; and (4) implementing the system. (AF)

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PLANNING, PROGRAMMING, BUDGETING

For

OHIO'S PUBLIC INSTITUTIONS

of

HIGHER EDUCATION

by

John D. Millett

U.S. DEPARTMENT OF HEALTH, EDUCATION
& WELFARE
OFFICE OF EDUCATION
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PREFACE

The intent of this book is to provide a common framework within which it is hoped that Ohio's various publicly sponsored institutions of higher education can and will perform their existing planning, programming, and budgeting procedures. There is no desire on the part of the Ohio Board of Regents to fix any public institution into a standard mold. Rather, this book recognizes that all institutions do have their own planning, programming, and budgeting processes. If these processes can be guided by certain common understandings, then their products can be better comprehended by others, including the Board of Regents.

There is nothing new in the concept of planning as a management procedure, or in the concept of programming, or in the concept of budgeting. What is relatively new in the past decade has been the effort within the context of various types of organized enterprise to combine planning, programming, and budgeting into a system, into a coherent pattern of interrelationships. This effort is one which holds the promise of improved management within an enterprise, a promise of more clearly relating means to ends and a promise of providing better choice among alternative lines of action.

In essence, planning-programming-budgeting is an ordered procedure for setting forth objectives, activities, and

expenditure requirements. Objectives of an enterprise should be carefully formulated and should be capable of realization in terms both of purpose and available resources. When available resources are limited, as they always are, then more limited objectives may also be appropriate. Planning-programming-budgeting is not concerned with simply describing the ideal but rather with accomplishing the feasible.

Moreover, planning-programming-budgeting is important to managers as a means of projecting long-term goals and commitments. Usually, programming and budgeting are undertaken by periods of time with an incremental impact upon planned objectives. If this incremental impact is to be more than haphazard or fragmentary, then programming and budgeting must be seen and used as means toward long-term goals. The costs of current activities must be continued in future years unless these activities are to be curtailed, modified, or abandoned in favor of priority for other activities.

Planning-programming-budgeting presupposes that management in an enterprise will endeavor to maximize rationality in the utilization of resources. Here we mean by rationality a shared understanding within the enterprise of purposeful endeavor. Management is a process of utilizing available resources effectively in the realization of desired goals. This process necessarily emphasizes:

1. The establishment of carefully and specifically defined objectives through planning.

2. The analysis of programs or activities in terms of their contribution to accomplishment of the established objectives.

3. The translation of programs into expenditure requirements, and the evaluation of program alternatives in terms of available resources and cost effectiveness.

Necessarily, planning-programming-budgeting must take place within the context of purpose. For this reason, considerable attention must be given herein to the problems of purpose within an enterprise of higher education. It is no simple matter to define purpose for an institution of higher education. The general tendency is for colleges and universities to express purpose in quite general ways, partly because purpose means different things to different persons engaged in the academic enterprise; partly because purpose is apt to be somewhat indefinite or uncertain when concerned with learning as individual development.

Necessarily, planning-programming-budgeting must take place within the context of organization. The technology of the higher education enterprise, like the technology of other enterprises, is one of specialization of labor. The alternative to organized endeavor of many persons working together for a common purpose is the individual person working separately to accomplish some purpose. Civilization and society involve division of labor and hence a structure of organization. Division of labor has proven in most instances more productive

and more effective than individual labor. The state of knowledge today in society is in large part the product of specialization in the transmission and advancement of knowledge.

Necessarily, planning-programming-budgeting must take place within the context of output. The purpose and the organization of higher education (and within organization, the process of higher education) obtain concrete meaning only in terms of units of production. To many persons the language of production is alien to the purpose of higher education, which they see as a work of art rather than a designed artifact, and yet works of art assume concrete form as a poem, a drama, a novel, an exposition, a painting, a building, a piece of music, a piece of statuary. The concept of output can surely be applied to higher education without imposing some intolerable burden upon the learning process.

The sections which follow have been prepared in an effort to set forth certain common factors or aspects of planning-programming-budgeting for Ohio's public institutions of higher education. It must be emphasized again that there is no desire on the part of the Ohio Board of Regents to prescribe a standard pattern of purpose, organization, and output upon any individual institution. There is no desire to prescribe a standard management process of planning, programming, and budgeting. There will undoubtedly be variations in pattern and management process among individual institutions.

The Ohio Board of Regents is concerned only that patterns of purpose, organization, and output be consciously determined and clearly delineated. The Ohio Board of Regents is concerned only that planning, programming, and budgeting be integral parts of the management process in every public institution of higher education. The end result should be advantageous to the performance of higher education as a highly productive social enterprise, and hence advantageous to public confidence in higher education as a consumer of public resources.

My staff associates have assisted me in reading this manuscript and in providing the data upon which many illustrations are based. At the same time, my associates have suggested that my name should appear on this publication because it reflects in so many ways my study and experience in higher education now extending over 35 years since I first served as a teaching assistant after having received the master's degree and while pursuing my doctoral studies.

JOHN D. MILLETT
Chancellor

Columbus, Ohio
May 1, 1970

THE PURPOSE OF HIGHER EDUCATION

Higher education is a social institution. In a pluralistic society, higher education takes its place alongside such other institutions as the family, privately sponsored business enterprise, the polity, the church, elementary and secondary education, the military, the governmental bureaucracy, the professions, and the voluntary associations. Higher education does not have as its purpose the replacement of any of these other social institutions. By its nature, however, higher education is supportive of and contributory to these other institutions. In turn, higher education may look in various ways to these institutions for support of its own endeavors.

Moreover, the higher learning which is the particular province of higher education is a social process. It is fully recognized that only an individual learns. No person learns for another person. Learning is as individualized as being itself. But the individual learns in relation to experience, and experience is almost always a social process. The individual learns by imitation of other persons; the individual learns from his relationship to and interaction with other persons; the individual learns from his environment, which is usually influenced if not determined by other persons; the individual learns from what other persons have learned; the individual learns in terms of language provided by other persons.

In all its wonderful detail and infinite variety, in all its time sequence from birth to death the individual learns in a social setting.

Yet even when higher education is generally understood as a social institution and a social process, the purpose of higher education in American culture remains elusive. Perhaps a more accurate way to express the problem is to say that higher education as an institution professes various purposes. The individual faculty members who constitute the professional practitioners of higher education express the purpose of their endeavors with different concepts and seek the accomplishment of their avowed purpose in different ways. The individual higher educational enterprise, the particular collectivity usually known as a college or university, seldom formulates its sense of purpose in other than quite general statements subject to varied interpretation and varied performance.

The individual students who constitute the active participants in the formal process by which the higher learning is transmitted express their purpose also with different concepts. Moreover, in the decade of the 1960's in the United States, students began particularly to insist that their sense of purpose should be given more and more attention within a higher education enterprise. Yet this insistence as a general proposition was almost impossible to apply in particular circumstances since students, like faculty members, have had varied ideas of purpose.

In such a social setting, it is little wonder that higher education as a social institution has had to set considerable store upon values of diversity, variety, tolerance, mutual accommodation, and academic freedom. A commitment to these values of diversity, variety, and academic freedom is essential in order for higher education as a social institution to function as it has developed in the past one hundred years. Otherwise, we may find that colleges and universities will be more closely integrated as sub-units of other social institutions, such as business, professional groups (law, medicine, dentistry, etc.), the public schools, and governmental agencies.

The financial support of the institution of higher education is different from that of other social institutions. Privately sponsored business enterprise obtains its resources primarily by the sale of products and services. The polity obtains its resources primarily by taxation. The church obtains its resources primarily from the contributions of its members. The professions obtain their resources primarily from the sale of services to their clientele. The voluntary associations obtain their resources primarily from the collection of membership dues, supplemented to some degree by contributions. Higher education as an institution may obtain its resources in part from the sale of services, but the resources must be supplemented from taxation and from contributions. When the primary clientele group tends to be concentrated in the age group 18 -

through 26 years of age, this clientele is seldom expected to meet the entire expense of its instructional service. Society as a general beneficiary of the higher educational endeavor is asked to assist in making resources available to higher education by means of taxation and contributions (philanthropy).

If society is to be asked to assist in providing resources to higher education, then higher education in turn must avow a social purpose as the basis for the request. If the higher learning is to be made available to individual students not upon the basis of ability to pay but upon the basis of the meritocratic standard of individual ability, then higher education must obtain resources from society as a whole rather than from individuals. There is a social benefit in maintaining an open society which recruits, makes use of, and rewards the talent of individuals regardless of their social background.

Instruction

The instructional purpose of higher education is usually formulated in both individual and social terms. The teacher-scholar in higher education seeks to transmit knowledge to students, to conserve knowledge, and to advance knowledge. The student seeks to learn, including the learning of how to learn. Both teacher-scholar and student seek to augment or advance their knowledge stock to the fullest extent of their learning capability.

For the individual, whether teacher-scholar or student, learning is an end in itself, a purpose which is its own justification, its own reason for endeavor. The individual places a value upon knowledge as opposed to ignorance, upon reason as opposed to superstition, upon rationality as opposed to emotion, upon defined purpose as opposed to authoritarian power.

For society, both knowledge and the educated individual are a social utility. Ours is an age of knowledge, an age when the advances in knowledge have brought extensive benefits in health, in useful products, in communication, and in national security. The application of knowledge has had its disadvantages, too: the threat of possible annihilation, pollution of environment, large-scale consumption of raw materials, the persistence of poverty for some people. Yet there seems to be no effort to solve these problems which does not entail further knowledge rather than less. Moreover, in considerable part, society has provided substantial monetary remuneration to educated talent. Knowledge is an inert property; it must be used by people, and mostly it can be used only by educated people.

In social terms, the purpose of higher education is to meet the demand for educated persons required for professional practice, and now required also for practice as professional associates. The United States throughout its history has been fortunate in that the demand of the economy for educated persons has almost always outrun the available supply. Moreover,

professional mobility seems to have been fairly common in the past, with persons educated in one field qualifying by ability and experience for employment in another professional field. Such mobility has been especially evident among persons educated in law and in engineering, but has been demonstrated elsewhere.

Anyone familiar with educational systems in other countries is well aware that it is possible to educate more professional persons than the economy can usefully employ. This phenomenon has been observed in a number of less developed countries. This circumstance has not existed in the history of the United States up to 1970. This fact does not mean, however, that such a complication might not occur sometime in the future.

Because the economy of the United States has developed continuously and with considerable momentum during the Twentieth Century in particular, the demand for professionally educated persons has continuously risen. If development of the economy were to slow down in the remaining thirty years of this century, then the demand by the economy for educated persons might very well experience some slowdown as well. Or another possibility would be that highly educated talent would be employed in positions requiring considerably less education than the individual brought to his job.

In any event, the instructional purpose of higher education cannot be divorced from its social contribution, especially if society is to be asked to provide increased financial and other support for higher education. The case for social support

of higher education rests upon the social purpose of that education. Elementary and then secondary education became universal in the United States primarily upon the basis of the argument that a democratic society and polity required a literate citizenry. The case for higher education necessarily rests upon a different kind of assumption, and that assumption is the contribution of educated talent to the physical material, and other well-being of the American people.

Research

In addition to providing educated talent to the American economy, higher education has also contributed an expanding knowledge to American society. The advancement of knowledge in the physical sciences, in the biological sciences, and in engineering and medicine have been spectacular in the past thirty years. The application of knowledge has given us new drugs and new surgical techniques to overcome disease. The application of knowledge to agriculture has given us the highest rate of agricultural productivity in the world and the smallest proportion of the labor force engaged in the production of food and fibers to be found any place in the world. The application of knowledge to production has given us new forms of raw materials (such as plastics), new means of communication (such as television and the radio-telephone), new products (such as dishwashers), new means of transportation (such as the jet aircraft), new means of data processing (such as the computer), new means of production

control (such as automation), new forms of energy (such as atomic fission and fusion), new weapons (such as missiles and the atomic bomb).

When one turns to advancement of knowledge in the humanities and the social sciences, the record is less spectacular. Yet the opinion survey as a marketing technique and for general informational purposes is an application of knowledge obtained from social psychology and statistics. Economic analysis is an application of knowledge obtained from economics, and especially econometrics. Advertising is the application of knowledge obtained from social psychology and art. And many other fields of social activity, from law enforcement and judicial judgment to social work and education draw upon an advancing knowledge in the social sciences and humanities.

Because of the importance of knowledge in terms of application to social needs or desires, and because research is the primary technique for the advancement of knowledge, research has become a major purpose of American higher education in recent years. How this purpose can and should be integrated with the instructional purpose of colleges and universities has created much concern in the past ten years. It has been frequently asserted that the best abilities in the academic enterprise have been devoted since World War II to research rather than to instruction, especially undergraduate instruction. In part this situation, if it has existed, has arisen because of the urgency of research activity in the past thirty years,

because of the extensive financing of research by the federal government, and because many academic minds found research to be personally more challenging and more rewarding than instruction.

Public Service

Still another basic purpose of higher education has been that of public service. Although the phrase "public service" has been much used in discussions of higher education, there has been very little effort made to define the scope of this endeavor with any care or precision. The two best known public service activities have been those of the agricultural extension service and the university medical center. The two are quite different in nature, and yet they well illustrate the ways in which public service becomes germane to higher education.

Agricultural extension service was encouraged by the federal government through passage of the Smith-Lever Act of 1914 providing grants to states for extension activities in agriculture and home economics. From this beginning developed a cooperative endeavor involving federal-state-county collaboration and joining colleges of agriculture with agricultural experiment stations in a common effort. The agricultural extension service was intended primarily to bring the best available knowledge about agricultural practices to the family

farm. Because of the home economics involvement, this effort was broadened to include assistance to the farm household in home management and child rearing.

Essentially, agricultural extension is an organized endeavor at continuing education, at providing instruction in new knowledge and new skills to the adult farmer engaged in agricultural production. This instruction may be provided through various short courses, through demonstrations, through pamphlets and other reading material, and through actual visitation to individual farms. Often the problems which farms encounter in soil condition, in pests, and in animal and plant disease lead to projects in agricultural research or agricultural development. In turn, agricultural education is influenced by "feed-back" from farm operations and by the advancing knowledge of agricultural research. Recently, moreover, agricultural education, research, and service have expanded the scope of their interest to include food processing and distribution and business enterprises involving trees, shrubs, and flowers.

In the case of university medical centers, it has been very difficult to draw any careful distinction between instruction in medicine, medical research, hospital service, and continuing education in medicine. Instruction in medicine as now conducted in the United States requires students to observe and even to participate in the actual treatment of patients. This arrangement demands the presence of patients,

both clinical patients and hospital patients. In addition, the doctor obtaining the degree of doctor of medicine is required to spend one year in internship and from two to five years in residency before he or she begins the individual practice of medicine. This internship and residency are largely spent in the treatment of patients, under varying degrees of supervision by a senior practicing physician or surgeon. A university medical center -- a college of medicine and hospital combined -- engages in medical research, largely with animals but at some point involving actual experimentation under carefully controlled conditions with human patients. From such research and experimentation is derived the new medical knowledge which must then be communicated generally to practicing doctors for application in the treatment of patients.

In this closely inter-related process of medical instruction, patient treatment and care, research, and continuing education, the medical center incurs substantial costs of operation. Administrators of a medical center are concerned about the total resources required to operate the center. They see little reason to segregate expenses by major purpose: instruction, research, patient treatment, and continuing education. These last two activities would ordinarily be classified as public service.

The reason for endeavoring to draw sharp distinctions between purposes undertaken by a medical center results from differences in financing the work of such a center. Medical

instruction in a public university or college of medicine is financed by student fees and public appropriation for instruction. Medical research is largely financed by federal government grants and foundation grants, with some supplement from state appropriation. Patient treatment and care is financed by charges to patients (including insurance payments and welfare payments), supplemented by state appropriation and philanthropic contributions. Continuing medical education is largely financed by charges to medical practitioners. Only if the purposes are clearly delineated and the expenditures for each purpose clearly segregated will it be possible fo determine the adequacy of the financing available for these inter-related endeavors.

The medical center is not the only activity of a university involving direct service to a clientele group. A college of dentistry will entail operation of a dental clinic providing patient care. A speech and hearing therapy program may also provide patient care. A program in clinical psychology will involve patient counseling. Teacher education may require operation of a school with students enrolled in classes. A program in speech may involve operation of a radio and television broadcasting facility. A program in art, music, and drama may involve operation of an art gallery, of a recital hall, and a theater. A program in avaiation engineering and in flight training will require operation of airplanes. An engineering course may require a testing laboratory to determine strength of materials and other properties of materials

with engineering applications. All of these instructional activities and others as well frequently result in service of benefit to particular individuals. In turn, a college or university must decide whether or not to charge for such public service.

More recently, because of the concern for the relationship between research and economic development, a new form of public service has arisen which for lack of a better term we may label "technical service." This service, oriented toward business and industry rather than toward agriculture or the professions, has sought to encourage two-way communication in the physical sciences, mathematics, computer sciences, and engineering. On the one hand, some more formalized means has been sought for presenting research problems of business and industry to university staffs. On the other hand, some more formalized means has also been sought to channel research results to business and industry. Informal and professional contacts between universities and business and industry have long existed. The question has been whether or not more formalized relationships would be mutually advantageous. Such an experiment in relationship has been supported by the federal government under the State Technical Services Act of 1965.

The whole subject of consulting services by higher education has been a troublesome one. What consulting services is it appropriate and desirable for a college or university to render in the name of the enterprise or a subordinate unit of

the enterprise? For example, it has been customary for many colleges of education of a state university to set up a bureau or center of educational field services and to render consulting service on state or school district problems as requested, usually with an appropriate charge for the service rendered. In some states a state university has set up a bureau or center of public administration to render consulting service to governmental bodies when requested to do so. On the other hand, privately initiated and managed consulting firms are apt to be critical of university consulting services as constituting a kind of unfair (non-tax-paying and subsidized) competition.

Individual faculty members may be in demand for consulting services to governmental agencies, professional practitioners, professional associations, and business and industry. It is customary to recognize that such consulting service is an appropriate form of public service for faculty members to render but that such consulting service is better arranged on an individual basis rather than upon the basis of a university commitment. Where this decision has been made, it is also customary for a university to establish some work-week requirement for faculty personnel when under contract for full-time professional service to the university. For example, it may be university policy that a full-time faculty member shall be physically present on the university campus 4 days a week for not less than 8 hours a day. Any time spent in consulting

activity over and beyond these professional obligations to the university then becomes a personal and individual matter.

Social Activity of the University

Instruction, research, and public service have ordinarily and traditionally been accepted as the basic purposes of a university. Such instruction, research, and public service are undertaken as a social contribution by higher education. Together, these three types of effort constitute the educational mission of an individual higher educational enterprise.

In recent years the question has been raised by some groups whether or not a university has social obligations beyond the three kinds of activity just enumerated. Should the purpose of higher education be broadened or extended beyond instruction, research, and public service?

It is argued by some groups of persons that instruction should be more closely integrated with social needs: that some students, for example, should be educated particularly to work in a ghetto environment. This kind of sharper focus in an instructional program may or may not be a desirable modification of instructional purpose by a university.

Beyond the question of instructional focus, however, is the matter of the role of higher education in promoting desirable change in the behavior of other social institutions.

Let us assume that change in the behavior of social institutions is desirable; even then the degree and the direction of desirable change obviously will be concerns upon which reasonable men may disagree. Let us assume that the economy and the individual enterprises in the economy ought to give greater attention to and evidence more action in elimination of pollution in the environment. Let us assume that families should give greater attention to and evidence more action in the planning of family size: Let us assume that voluntary associations should give greater attention to and evidence more action in opening membership to Black Americans, Indians, and Spanish Americans. Let us assume that the polity should give greater attention to and evidence more action in elimination of poverty. If we assume that these and other changes may be desirable, there still remains the question about the role of higher education in helping to accomplish these changes.

The traditional answer, as pointed out already, is to say that higher education responds to social needs through instruction, research, and public service. Higher education does not respond by substituting its judgment (however determined) for the regular process of family action, economic action, political action, church action, voluntary association action, etc. Nor can higher education become an instrument of monolithic power in a pluralistic society whereby all family, economy, polity, church, and voluntary association power is eliminated and only higher education power will henceforth be

exercised in all these realms of social action.

The fact that serious and far-reaching questions have been raised about the purposes of higher education indicates one of two circumstances: (1) the purposes of higher education are not well understood by many persons in American society, such misunderstanding arising probably from a failure on the part of higher education itself to make that purpose clear; or (2) the traditional and current concept of purpose for higher education is not acceptable to some groups in American society.

Auxiliary Services

Over a period of time, many colleges and universities in the United States have found it necessary to assume an auxiliary purpose: to provide students with a home away from home. In Nineteenth Century America, the nation was predominantly rural and sparsely settled in population. Large cities were relatively few in number. The colleges and universities founded in that century were often located in small towns, and students lived either with families in the community or in dormitories of the college.

In the Twentieth Century, three important changes took place. First, as the United States became predominantly an urban rather than a rural society, some colleges and universities were started in large cities, and those which had earlier

been located in cities began to expand. Secondly, as the affluence of American families advanced, more students went away from home at age 18 to enroll in college. Thirdly, colleges and universities in the 1930's and 1940's were expected to provide more and more services to the students, whether residential students or commuting students.

In consequence, higher education has become heavily involved in providing auxiliary services to students: a residence hall program, a health program, a recreational program, a social program, a cultural program (drama, music, lectures), a student publications program, a special counseling program, and a placement program. Colleges and universities were required to provide both facilities and current operating support for these services. To this array of auxiliary services must be added intercollegiate athletics, which provides spectator sports for many students and participation in athletic competition for student-athletes of special skill.

Interestingly enough, the various auxiliary services to students came under serious discussion during the decade of the 1960's on some college and university campuses. Partly this discussion raised issues of expense to students in providing the facilities and operating income for these services. Partly this discussion raised issues of the need for these various services, and whether or not students should determine their own individual need and interest in these services and should pay for them on a user charge rather than a taxation

basis. Partly this discussion raised issues of the relationship of a college or university to students: should this relationship involve only a narrowly interpreted educational interest in students or should this relationship involve a broader interest in the social environment of the student which might affect student academic performance.

It would be accurate to say that the auxiliary purpose of higher education is under extensive review on many campuses today and that the entire subject is one in which new directions may be emerging.

Student Aid

In terms of access, the traditional purpose of American higher education has been stated in such terms as these: to provide educational opportunity to high school graduates in order that these persons may carry forward their formal educational effort to the fullest extent consistent with their interest and ability. Such a definition of purpose conceals as much as it reveals.

Access to higher education is generally limited to high school graduates. Normally, the high school drop-out will not be admitted, although older persons with military or other experience may be given an opportunity to enroll upon a finding of the equivalency of a high school education. At the same time, it is recognized that many high school graduates will

not be motivated to enroll in higher education or will not have the mental ability required to complete successfully an associate degree program or a baccalaureate program.

We know that at 18 years of age, for the United States as a whole, about 80 percent of the age group graduate from high school. Of all high school graduates, about 55 percent enroll in a college or university. This means that about 44 percent of all 18 year olds as of 1969-70 seek the opportunity of higher education.

We also know that of those who do enter college in the United States about 72 percent of all men and over 80 percent of all women have graduated in the upper half of their high school class in terms of high school grades. It seems probable that the performance standards expected in higher education are such that about one-half of all 18 year olds might enter and complete a two-year program, and that about one-half of the one-half (25 percent of all 22 year olds) might complete a baccalaureate if motivated to do so.

Regardless of the academic standards which may determine access to higher education and retention in higher education, there is another possible barrier to higher education: the ability to meet the expense of higher education. Access to higher education is not free of cost to the individual student or his family. Many economists point out that the first item of cost for the college student is income foregone while enrolling as a student. This cost, of course, presupposes that

there is a job available in the American economy for every high school graduate -- an assumption which would be true only in a much less sophisticated technology than the one the United States now enjoys.

Apart from income foregone, there are direct expenses for every student to meet when he enrolls in college: (1) instructional charges, (2) room and board charges, (3) book and supply costs, (4) transportation costs, (5) clothing and personal expenses, and (6) recreational and incidental expenses. These costs vary a great deal under different circumstances.

Instructional charges are generally less at publicly sponsored colleges and universities than at privately sponsored colleges and universities. The difference may be in the order of magnitude of $650 compared with $2,000.

If a student resides away from home, his room and board charges may be as much as $1,000 or more for a nine months period. If a student resides at home, his room and board charges may be absorbed by the family or be much less than those for residence at college. Probably no single item of direct college expense varies more than the difference between enrollment on a commuter basis and enrollment on a residential basis. This means in effect that the availability of colleges and universities on a commuting basis may be the most important single form of student financial assistance provided to students.

The commuting student, to be sure, may have daily or

frequent transportation charges. If the student is compelled to commute by private automobile, this cost can be fairly sizeable. On the other hand, the student who enrolls on a residential basis will have transportation expenses, also, depending upon the number of times he moves back and forth between campus and home during an academic year. The frequency of such movement at a minimum would be three times, and is more likely to be about six times or more a year.

Other expenses vary according to the personal preferences and the resources of individual students. Many colleges and universities develop a model student expense budget for the students enrolling at a particular campus.

We know that the major source of financing the direct expenditures of students enrolling in higher education is family financial assistance. Some 45 percent of all undergraduate men students and about 60 percent of all undergraduate women students depend entirely or almost entirely upon their families for financial support while in college. Over one-third of all undergraduate men students and about 20 percent of all undergraduate women rely primarily upon personal savings and upon employment to meet the expenses of college education. Another 30 percent of undergraduate men and women students depend primarily upon loans or scholarship or grant funds as the major source of income with which to meet higher education expenses.

It is clear that student financial aid in the form of employment, scholarship grants, instructional grants, and loans

is a major factor in eliminating the economic barriers to higher education for the motivated and competent student. The geographical location of institutions and the size of the instructional charge to students are other factors in reducing economic barriers.

Summary

The purposes of higher education in general and of individual colleges and universities in particular must be determined within the context of the following considerations:

1. Instructional objectives
    a. Individual development of the student
    b. Manpower requirements of the labor force for educated talent
2. Research
    a. To advance knowledge
    b. To assist in the solution of pressing social and governmental problems
3. Public service
    a. Adult general education in cultural and public affairs
    b. Continuing professional education
    c. Services to public incidental to instructional programs
    d. Technical services to link research work of higher

education with development work of government and business

e. Consulting services

4. Auxiliary services to students

a. Residence service

b. Health service

c. Counseling and placement service

d. Recreational service

e. Social activities

f. Publication activities

g. Cultural activities

h. Student participation in college or university affairs

i. Intercollegiate athletics

5. Student financial assistance

a. Location of campus

b. Instructional charges of campus

c. Employment

d. Grants

e. Loans

THE ORGANIZATION OF HIGHER EDUCATION

Planning, programming, and budgeting must be performed through an organizational structure of an enterprise. Such planning, programming, and budgeting in a higher education enterprise must conform to the organizational structure of the college or university.

It is, of course, to be expected that the organization structure of a higher education enterprise will vary from college to college, from university to university. Individual enterprises will vary in enrollment size, in scope of programs, in plant resources, in total operating budget. There is no intention here to prescribe a standard organizational pattern for any particular college or university. Rather, in the discussion which follows we shall present a generalized organizational structure from which there may be departures in individual colleges and universities appropriate to their circumstances.

For our purposes here, we shall identify three levels of organizational structure. In a college offering two-year programs only, two levels of organization may be satisfactory. In a university three levels of organization would ordinarily exist. There is no intention to suggest exactly what organizational detail would be expected at each of these levels of structure. Any mention of particular units or organization

is not prescriptive but only illustrative.

The activities of an enterprise fall into two broad categories: operations and administration. Operations entail activities which produce an end item of goods or service for the benefit of a clientele group. Administration encompasses the provision of services and the management of resources needed to enable an enterprise to carry out its operations. The operations of a higher education enterprise entail instruction, research, public service, auxiliary service, and student aid. The administration of a higher education enterprise encompasses the management of input resources of people, plant and equipment, supplies, internal services, and technology in the performance of the planned operations.

Because we are concerned here with planning, programming, and budgeting as a management process within a higher education enterprise, we shall focus our attention upon the management organization structure for the performance of higher education operations. In universities, the management structure usually consists of three levels:

1. Operations management (the departments)
2. Program management (the colleges)
3. Enterprise management (the university)

Operations Management

The basic operating unit of a college or of a university is an instructional department. This department represents

a specialized discipline of learning (in the humanities, social sciences, biological sciences, physical sciences, and mathematics), or such a department may represent a recognized sub-division of a professional field of study (as in agriculture, business, engineering, medicine, and teacher education). Sometimes a school or division may be set up rather than a department as the basic operating unit (as in architecture, music, art, journalism, and nursing); these schools or divisions do not have a departmental structure even though there are recognized sub-specializations within the profession. Sometimes a college does not have a departmental structure for operating purposes (as in dentistry, law, pharmacy, and optometry); the college is then an operations as well as a program management level in university structure. Occasionally, it is possible that an interdisciplinary unit may be set up to offer courses of instruction, such as a center of American studies, a center of Asian studies, or a center of black studies.

The unique characteristic of an academic department is that it may be involved in the operation of several different programs of a higher education enterprise. The academic department often is not a uni-functional operation; rather it is apt to be a multi-functional or multi-program operation.

In its instructional operations, an academic department may participate in providing courses for a general studies

program, for a baccalaureate program, for a master's degree program, and for a doctor's degree program. This situation, of course, will obtain primarily in a department which is a discipline, but a professional department may participate in a baccalaureate professional program, a master's degree program, and a doctor's degree program.

In addition, the personnel of an academic department may be involved in the performance of a specialized research project or of a specialized public service project. Here we refer to separately budgeted research projects and separately budgeted public service projects and not to such research or public service activity as a faculty member may carry on incidental to or in addition to his instructional activity.

In a university there may be research centers set up to perform separately budgeted research projects; these then become units of research operations. It is also possible that specialized institutes, clinics, or services may be established to perform public service activities; these then become the operating units for public service activities.

It is possible that a single faculty member may be assigned for budget purposes to three different operating units of a university: (1) to an academic department for instructional activity; (2) to a research center for research activity; and (3) to a public service institute for public service activity. The faculty member is thus engaged on a part-time

basis in as many as three different kinds of programs of a higher education enterprise.

Auxiliary service operations are usually organized upon the basis of various types of services provided by the enterprise. The common kinds of services include a student health service, a student residence hall service, a student center service, a student recreation service, a student counseling service, a student publications service, a student government organization, and an intercollegiate athletics service. Each of these operations may be of substantial scope and involve the expenditure of considerable sums of money. Each of these operations presents unique kinds of problems to be resolved within a higher education enterprise.

Finally, there is a student aid operation which consists of an office organized to receive applications for employment or for financial assistance from students who desire help in meeting their direct expenses of enrollment in a college or university. Such financial assistance may or may not be awarded upon the basis of financial need. Employment, scholarships, and fellowships are frequently provided upon the basis of individual ability. Grants and loans are often awarded upon the basis of the family financial circumstances of the student. The student assistance operation has become a fairly sizeable activity in many higher education enterprises.

Program Management

As has been mentioned earlier, the unique feature of organizational structure in a higher education enterprise is that the basic operating unit for instruction has not been set up on a program or functional basis. Rather, the academic department has been established upon the basis of the subject matter taught, upon the basis of the discipline or the professional field of knowledge which constitutes the specialized competence of the persons gathered together as an academic department. As has also been mentioned, the academic department may be involved in offering instruction in several different instructional programs and may be involved in providing research and public service in addition to instruction.

Because of this basic organizational arrangement, a higher education enterprise has usually found it necessary to establish an organizational level for program management. Instructional programs are organized around degrees offered by an enterprise. There will be further discussion of these programs in a subsequent section. It is necessary here only to observe the existence of a program management level of organization as a customary structural feature of a higher education enterprise.

The program management level of organization is usually designated a college. In a two-year enterprise, there may be two program divisions rather than a college: a division of

general studies and a division of technical education. In a university there may be one or more colleges for baccalaureate programs in arts and sciences, various colleges for baccalaureate professional programs, various colleges for graduate professional programs, and a graduate college for graduate programs in arts and sciences and certain professional fields of study.

The program management level of organization has several different duties to perform. Usually, it has the authority to determine in the first instance the curriculum for an instructional program, the course and credit hour requirements for an instructional program, the standards for student admission to the program, the standards for student performance in the program, and the determination of those students who have fulfilled the requirements for award of the degree.

In addition, program management is usually involved in a number of faculty and student matters which affect the offering of a particular program of instruction. There are questions of standards in the appointment, tenure, and promotion of faculty members. There are questions of faculty salary levels. There are questions of staffing standards for a program, involving also issues of instructional technology. There are also questions of student counseling about the fulfillment of degree requirements, and questions about student placement in professional employment upon completion of a degree program.

Many of these curriculum, faculty, and student questions may be handled initially at the operations level, the level of the academic department. But many of these issues must be resolved at the program management level. Moreover, there are always issues to resolve concerning the extent of coordination, or harmonious relationship, to be achieved among the various departments which participate in the operation of a particular instructional program.

Program management is much less complicated for the research, the public service, the auxiliary service, and the student aid activities of a higher education enterprise. Here operations and programs tend to be the same. Usually the operating unit has complete jurisdiction over the program. To be sure, program policies and program procedures may be subject to review and coordination at the level of the enterprise management, but for these endeavors the organization structure of a higher education enterprise tends to be a two-level rather than a three-level arrangement: an operations-program level and the enterprise management level. Research and public service projects are sometimes operated at the program level of a higher education enterprise rather than at the academic department level. There are definite advantages in this arrangement when it is desired to bring together persons from different specializations to work on research problems and upon public service projects.

Because of the peculiarity of the academic department as an operating unit participating in multi-program activities, at various times it has been proposed that a new organization structure was needed for the higher education enterprise. For example, it has been suggested on occasion that there ought to be a college of general studies to offer a general studies program, with departments or divisions appropriate to the program offered by the college. Thus, there might be a division of physical science within this college which would be composed of chemists and physicists teaching solely in the general studies program. There might be a college of arts and sciences with a department of physics offering only a baccalaureate program. There might be a graduate college which would include a department of physics offering only master's and doctoral degree programs in physics. Accordingly, there might be some physicists in a department teaching general studies, some in a department offering baccalaureate instruction, and others in a department offering only graduate programs. Indeed, organizational structures of this kind have been tried in certain higher education enterprises at various times.

The single-program academic department, however, is not the prevailing organizational arrangement for a higher education enterprise in the United States. The single-program academic department is the exception rather than the rule in Ohio's state-assisted universities. The prevailing academic

attitude is that instructional departments should bring together all the persons competent in a particular discipline or professional field of knowledge, and that all these persons may at various times contribute their talents and their energies to the various programs of the enterprise.

Program management thus becomes a continuing management challenge in the higher education enterprise where the operating units perform multi-program activities.

Enterprise Management

The top management level in a higher education enterprise confronts three different kinds of endeavor. It must perform certain supportive services for the instructional activity. It must perform certain internal services necessary to the continued existence of the enterprise as an enterprise. And it must perform the general supervision and coordination of all operations needed to maintain the enterprise as a viable, continuing endeavor.

There are certain specialized activities within a higher education enterprise which are supplementary to the instructional programs. These activities may be considered as indispensable to the instructional operations but as not having quite the same characteristics as the instructional programs themselves. These supportive services are usually organized at the enterprise level; that is, these supportive services

are provided on an enterprise-wide basis and their performance is also supervised at the enterprise management level.

Among these supportive services are a Division of Libraries, a Division of Instructional Services, a Division of Broadcasting Service, a Division of Computer Service, an Office of Admissions, and a Registrar's Office. The Division of Libraries provides an enterprise-wide library service. A Division of Instructional Services provides audio-visual and other instructional materials to faculty members. A Division of Broadcasting Service may provide closed-circuit television facilities as a medium of instruction. A Division of Computer Service may provide electronic data processing equipment and service to faculty members using data processing as an instructional and research tool. An Office of Admissions provides a central point of contact and of processing applications for admission in accordance with program standards. A Registrar's Office is a central point of student record keeping and of class scheduling.

Internal services include the collection of student accounts, the procurement and distribution of supplies and equipment, the provision of utility services, the provision of communication services (telephone, mail, etc.), the provision of transportation service, the employment of non-academic personnel, the disbursement of funds, the handling of all necessary accounts, and the maintenance of the physical plant. These internal services are performed on a centralized basis

for reasons of administrative efficiency and uniformity of endeavor.

In the third place, there are the general administrative duties which must be undertaken by an enterprise as a whole, especially planning, budgeting, and coordination. These duties are essential in order to define objectives, establish programs, achieve full utilization of resources without liquidating the enterprise, and ensuring accomplishment of planned goals. These top management or general administrative duties are often divided into such components as academic affairs, student affairs, financial affairs, planning, and development.

Perhaps a special word should be added here about student affairs. There was a time (for example, when I went to college in the 1920's) when a higher education enterprise gave very little attention to student affairs. There was usually a dean of men and a dean of women who concerned themselves with the few disciplinary problems which arose from time to time involving students, such as student drunkenness, student escapades, and student publications. Most advisory relationships were developed between student and individual faculty members. For a variety of reasons which need not be enumerated here, colleges and universities began after 1945 to develop a whole range of services for students: health services, recreational services, residence services, cultural services, etc.

More recently, a whole new era has been developing in the field of student relationships. Some services are no longer

desired by students. Supervision of the social and personal life of the student outside the classroom has been disappearing. At the same time, some students have demanded a definite role in academic planning, in evaluating academic performance, and in determining the position of the enterprise in relation to the society which supports the enterprise. The consequence is that higher education enterprises have had to give extensive consideration to their policies and their organization for handling student relationships.

Organizational Participation

The higher education enterprise is unique in its organizational structure because the elements mentioned here -- operations management, program management, and enterprise management -- do not constitute a hierarchy of authority. It is customary, a kind of conventional wisdom, to conceive of organizational structure in most enterprises as a hierarchy of authority and responsibility, a set of interrelationships among people working together which provides for differential status in terms of superordination and subordination. It is not important here whether or not such an organizational concept is an accurate representation of reality for economic enterprises, governmental administrative enterprises, and others. It is sufficient for our purposes to assert that such an organizational concept will not suffice for the higher education enterprise.

Internally, the operation of a higher education enterprise involves some very distinct groups of persons: students, faculty members, professional support staff (librarians, student personnel staff, admissions staff, registrar's staff, doctors, nurses, coaches, computer staff, audio-visual staff), operating staff (clerks, stenographers, storekeepers, custodians, building maintenance, grounds maintenance, equipment maintenance, housekeepers, cooks, food handlers and servers, dishwashers, bus drivers, purchasing agents, security officers, telephone operators), and administrators. These groups often tend to have different interests. Increasingly, many of these groups expect to have some part in the decision-making process of a higher education enterprise.

Administrators of a college or university (presidents, vice-presidents, deans, and their associates), responsible to lay boards of trustees, have long been considered to be the principal participants in a decision-making process having to do with the purposes, programs, and management of the enterprise. Actually, a very extensive scope of decision-making authority has been delegated, willingly or unwillingly, to faculty members: decisions about degree requirements, course offerings, student performance standards, student evaluation, instructional procedures, the selection and advancement of academic personnel. In many other areas of decision-making, such as the purpose of an enterprise and the programs to be undertaken, a kind of joint decision-making procedure has

evolved in which faculty and administrators may veto decisions of one or the other.

More recently students have demanded and have obtained a role in decision-making, first insisting that social regulations and standards of individual behavior outside the classroom should be established only with participation of student representatives. In addition, students have requested participation in faculty decision-making about academic programs and course offerings, degree requirements, student performance standards, and evaluation of instructional performance. Student interest seems likely in time to extend to almost every phase of operations in a college or university.

Also, there has been some unionization of operating personnel with a demand that hiring standards, rates of compensation, working conditions, and grievance procedures be subject to determination through collective bargaining. The reconciliation of collective bargaining with civil service procedures remains to be accomplished in Ohio and in other states.

These are some of the internal complexities of operation which exist in a higher education enterprise. The expectation of participation in the decision-making process by students, faculty, operating staff, and administrators necessarily influences planning, programming, and budgeting. But such expectation does not make less urgent the continuous functioning of these management processes or alter the basic organisational structure of operations management, program

management, and enterprise management.

It must be emphasized again that regardless of the internal decision-making process, a higher education enterprise is not self-financing, and hence can scarcely be self-controlling. Some activities of an enterprise may be performed on a self-financing basis, such as residence halls, some auxiliary services, some research projects, some public service projects. But more often, instruction, research, public service, and student aid depend in greater or lesser part upon external financing, upon government appropriations and philanthropic giving. Indeed, it has recently been observed about the higher education enterprise that its students obtain an instructional service for which they do not pay (at least in full), that its faculty produce an instructional service which they do not sell, and that public provides essential resources over which it exercises no control.

Many decisions affecting the operations of a higher education enterprise are made by law: admission standards, program offerings, the establishment of higher education enterprises, student conduct, and professional licensure. Other decisions may be made by state government administrative agencies. A higher education enterprise is not an autonomous entity. Planning, programming, and budgeting are necessarily performed in the context of the public interest, public attitudes, and public financial support.

Summary

Organization for utilization of resources within a higher education enterprise usually involves three levels of management. The assignment of activities for performance and for supervision may vary from one enterprise to another. A fairly typical organizational arrangement for a comprehensive university would be as follows:

A. Operations Management

1. Educational operations (instruction, research, and public service)
   a. Academic departments specializing by discipline
   b. Academic departments specializing by sub-divisions of a profession
   c. Schools or divisions without departmental organization
   d. Special instructional units of an interdisciplinary structure
   e. Research centers or institutes
   f. Public service units
2. Auxiliary service operations
   a. Student health service
   b. Student residence service
   c. Student center service
   d. Intercollegiate athletics
   e. Other services

3. Student aid operations

B. Program Management (divisions, schools, colleges)

1. Degree programs (curriculum, etc.)

2. Faculty affairs

a. Staffing standards

b. Personnel standards

c. Other

3. Student affairs

a. Admission standards

b. Advising and counseling

c. Placement

C. Enterprise Management

1. Supportive services

a. Libraries

b. Instructional services

c. Broadcasting service

d. Computer service

e. Office of admissions

f. Registrar's office

2. Internal services

a. Bursar's office

b. Purchasing

c. Communications

d. Utility services

e. Publication services

f. Personnel services

g. Disbursement and accounting

h. Maintenance of plant

3. Academic affairs

4. Student affairs

5. Financial affairs

6. Information and development

7. Planning

THE OUTPUTS OF HIGHER EDUCATION

Every enterprise of higher education, like every enterprise of another kind, is expected to produce results. In the case of higher education, of course, these results are unique to the nature of the institution. But being a unique enterprise does not exempt the college or university, as an organizational entity, from producing certain definable, even tangible results. These results are the outputs of higher education.

The usual discussions of higher education, as this social institution operates in the United States, do not generally give much attention to the outputs of each individual enterprise. Rather, there seems to be an assumption that while outputs occur, they must simply be assumed or are too unusual to be described. Neither assumption seems justified.

In general terms, the outputs of a college or university are educated individuals, new knowledge, and certain public service accomplishments. In the process of producing these outputs, a college or university develops a certain reputation, a kind of image, which is likely to endure for a considerable period of time. This reputation is a by-product of some importance, but it is not the measurable output which is the objective of an enterprise of higher education.

There is a good deal of uncertainty about how to define

an educated individual who is the output of the instructional process. There are studies which suggest that the quality of student output from the instructional process is closely correlated with the quality of student input. To some persons this finding seems to indicate that the instructional process itself is of relatively modest importance. A good student obtains a good education; a poorer student obtains a poorer education. This generalization may indeed be a valid conclusion from available data. The measurement instruments for determining the quality of student inputs and outputs and for determing the accomplishment of the instructional process are not sufficiently precise to permit convincing conclusions about the instructional process itself.

Similar problems in the identification of quality in higher education outputs arise in the areas of research and public service. Research output is usually identified in terms of research papers and monographs produced as a result of research input and process. Such papers and monographs are a tangible evidence of output. In themselves such products tell very little about the quality of the output, and even less about the practical application or utility of the output. The qualitative evaluation may depend upon the judgment of peers, while practical application depends upon a combination of circumstances which are not easily controlled. In the public service area the effort can be identified in various ways -- number of persons enrolled in continuing education courses,

the number of patients treated in a clinical setting, the number of hours of broadcasting provided by various types of programming, the number of consultative projects completed -- but the quality of output is not readily determined. What new or improved professional service results from continuing education courses? What cures were effected by medical, dental, psychological, hearing, or other therapy? What benefits were conferred upon the individuals who listened to educational radio and television broadcasting? What benefits resulted from consulting services rendered to a client? None of these questions can be answered with any certainty.

The complexities of qualitative evaluation, with their implications for the determination of output effectiveness in relation to input resources and productive effort, are quite real. Yet these complexities are no justification for believing that it is useless to endeavor to identify outputs from a higher education enterprise. We must identify outputs as best we can under present circumstances, and make appropriate efforts to continue to improve our ability to measure output in both quantitative and qualitative terms.

Output and Technology

The output of an enterprise is the product of two interrelated factors: input and process. Input resources are of various kinds, but are usually thought of as manpower, facilities, equipment, and supplies. The only available common

denominator for measuring these input resources is the use of a cost record: the dollar value placed upon man-hours of labor, upon the capital investment in facilities and equipment, upon the cost of supplies utilized in the productive process, and upon management. The productive process itself is the technology whereby input resources are converted into output.

In an enterprise of higher education there are, of course, unique elements of both input and process. In the function of instruction, input involves two major categories of persons: students and faculty members. In addition to facilities, equipment (including books), and supplies, input involves another resource, the current stock of knowledge in the discipline or field studied. In the function of research, input involves not only the usual resources of the researcher but involves also a research idea. Indeed, a considerable body of research experience indicates that the initial research idea is a very vital factor in research endeavor. This research idea is a major consideration in the research grant method of funding research projects.

Within the higher education enterprise, there is a technology for instruction, which we call the instructional process. There is a technology for research, a research process. There are various technologies for public service activities appropriate to the several different types of public service endeavor. There are also technologies for the performance

of auxiliary services and of student assistance. Here we shall be primarily interested in the technology of instruction.

An instructional program is based upon the utilization of one or more instructional technologies. These technologies are generally familiar to academic personnel. They include the tutorial process, the discussion class process, the lecture process, "independent" study, the cooperative work-study or intern process, the laboratory process, and the programmed learning process. In any particular instructional program with a particular instructional objective or output, these various technologies may be employed in combination or phases. Even new processes not entirely identified in this enumeration may be tried. It is seldom that any one instructional program -- a master's degree program in economics, for example -- will make exclusive use of one technology. The more common experience in a college or university is to find that in a given instructional program a variety of technologies will be utilized. To be sure, a particular program or a particular college may make more general use of one kind of technology than another.

The technology of instruction may also employ various media of communication. Much of the learning process which embodies the transmission of knowledge, the evaluation of knowledge, and the assessment of the scope of available knowledge depends upon communication between teacher and student. The means of communication include speech, reading, writing, and demonstration.

The media of communication include the use of these means of communication through ordinary interpersonal discourse, sound amplification, electronic communication (tape, radio, and television), and visual materials.

The technology of instruction is important to higher education planning, programming, and budgeting for quite obvious reasons. Desired outputs are a function of instructional technology. Programs to achieve instructional objectives necessarily incorporate particular technologies. And budgets reflect the expense of a particular pattern of instructional technologies.

Let us mention two or three obvious illustrations. The tutorial process of instruction may involve an instructor with a total of eight or ten students. Depending upon the compensation provided the instructor, we may expect this kind of technology to be expensive in manpower cost. The lecture process of instruction may involve an instructor with two hundred or more students. Again depending upon the compensation provided the instructor, we may expect this kind of technology to be less expensive in manpower cost. The use of television as a media of communication involves extensive equipment, a production and transmission staff, and considerable consumption of electric power. Depending upon the number of students receiving televised instruction, we may expect the cost to be high or low per student.

Technology, instructional effectiveness, and expense are

all closely inter-related. Our knowledge about these relationships, however, is extremely limited. Various studies about the instructional effectiveness of particular methods contrasted with other methods (discussion class versus lecture class, lecture class versus televised class, discussion class versus televised class) have found very little, if any, evidence to substantiate the proposition that one technology is notably superior to another, or notably inferior. Instructional effectiveness has been measured primarily by grades received by students participating in classes conducted under various procedures. When the student ability input is kept constant, student output in terms of grades received in a course does not vary notably with the particular instructional process employed.

It is often assumed that the more expense which is incurred per student, the more effective will be the instructional process. It appears from experience, however, that there is a closer correlation between the expense per student for instruction and the selective admission of students. In other words, the more a college or university tends to spend per student for instruction, the more selective tends to be the selection of students admitted to instruction. As a result, one is confronted with the question whether or not it is the expenditure per student which has determined instructional effectiveness. May not the real influence be the initial quality of student admitted to the instructional

process? It is fair to say that we know very little about the correlation between expenditure per student and instructional effectiveness.

Technology may be related to instructional effectiveness, but exactly which technology produces the greatest change in the capacity of an individual student to acquire knowledge, to utilize knowledge, and to advance knowledge, we do not know. It is generally assumed that different technologies are appropriate to different instructional programs, to different courses, to different students, to different faculty members, and to different learning environments. Here again, we do not know what technologies are appropriate to what set of circumstances. As a consequence, departments of colleges and universities tend to employ a considerable variety of instructional technologies in the hope that individual students will select the technology most appropriate to their needs or that somewhere in the instructional program a student will respond to a technology which has some effectiveness for him.

Instructional Output

There is one and only one satisfactory quantitative statement of output for the instructional process under current circumstances. This statement is credit hours of student enrollment in fulfillment of a degree program provided by a college or university. The universal language of higher

education is credit hours required in a degree program. For example, in order to obtain a degree for a two-year program in general studies, a student is usually expected to complete 90 quarter credit hours of course enrollment with a 2.0 grade average on a 4.0 scale. For a four-year baccalaureate in arts and sciences or in a professional program, a student would usually be expected to complete 180 quarter credit hours of course enrollment with a 2.0 grade average.

In any particular quarter a full-time student would usually be expected to enroll for 15 or 16 quarter hours of course credit. Thus the requirements for a two-year degree program would ordinarily be completed in six quarters, and the requirements for a baccalaureate program would ordinarily be completed in 12 quarters.

The customary course enrollment by a student is for a three-quarter academic year. Unless a student drops out of a college or university because of illness, poor performance, or lack of motivation, a student enrolling for the autumn quarter is expected to remain throughout the winter quarter and the spring quarter. Accordingly, the input resources required to produce the total credit hours of course enrollment for students in the autumn quarter is considered to represent the input resources needed for the full academic year of three quarters.

The summer quarter represents an additional output of

student credit hours and therefore requires additional input resources. Many students enrolled during the regular three-quarter academic year will not enroll for the summer quarter. Some students will enroll in order to speed up the total lapsed time in calendar years needed to complete the credit hour requirements of a particular degree. In some instances and for a variety of reasons -- financial, academic, and other -- a student will decide to reduce his total credit hour enrollment in the regular three-quarter academic year and will then make use of the summer quarter to catch up with the expected progress toward completion of a degree program. In still other instances, a student may be enrolled during the regular academic year on a part-time basis and so will enroll in a summer quarter in order not to prolong unduly the time needed to complete degree requirements. And in certain instances, such as in the case of public school teachers, the summer quarter may represent the only time available for enrollment, particularly on a full-time basis.

In consequence, the summer quarter must be considered as a special course credit output of the instructional process to be added to the output of the regular three-quarter academic year. The summer quarter must be considered separately both because the output is additional to that of the regular academic year and because the output is quite different from that of the regular academic year. The input resources of the summer quarter must be planned, programmed, and budgeted

separately from the input resources of the regular three-quarter academic year.

It would be useful, no doubt, to measure the output of the instructional process in terms of degrees awarded rather than in terms of quarter credit hours of course enrollment provided by a college or university. The end purpose of the instructional endeavor of a college or university is completion of an instructional program on the part of a student, and such purpose is normally recognized by award of a degree. In consequence, it is possible and reasonable to say that degrees awarded represent the true output of the instructional process.

The difficulty with this measure of instructional output is two-fold. For one thing, almost all degree programs require more than one year to complete. The customary budget period for most enterprises, including the enterprises of higher education, is one year. To budget on an instructional program basis rather than an annual basis would be difficult, because the normal duration of an academic program may be one or one and a half years (for some master's degree programs), two years (for an associate degree program and for some master's programs), three years (for a law degree program and certain other professional degree programs, and for doctoral degree programs), four years (for baccalaureate programs and medical programs), and five years (for an architectural program and some engineering programs). A second factor is that all students who enroll in higher education do not complete a degree program. Yet in

a particular budget year these students represent a part of the instructional output of a college or university.

Because budgeting must be undertaken on a year to year basis, because output on an annual basis is represented by credit hours of course enrollment produced, because credit hours produced on an annual basis is the only equitable measurement for programs of different duration, and because credit hours produced on an annual basis is the only equitable measurement for student enrollment which does not result in the award of a degree -- for all these reasons we must accept credit hours of student enrollment as the measurement of output resulting from the technology of instruction. Credit hours of student enrollment on an annual basis represents the progress a student makes toward completion of a degree program.

There is a very convenient "short-hand" method of reporting credit hours of student enrollment. This device is the use of a "full-time equivalent" student as the expression of credit hours of student enrollment produced annually. If the autumn quarter credit hours of course enrollment are divided by 15, then these credit hours are converted into a full-time equivalent student. The advantage of this practice is, first, that credit hours are expressed in a smaller, more easily handled figure, and, secondly, that output expressed in student terms rather than credit hour terms is more meaningful to most persons outside a college or university.

The number 15 is selected as the divisor because this is as representative a figure as is available to define full-time

enrollment by a student. The minimum requirements for a degree program are almost always stated in multiples of 15: 90 quarter credit hours for an associate degree; 180 quarter credit hours for a baccalaureate; 45 or 60 quarter credit hours for a master's degree; 135 quarter credit hours for the juris doctor degree; 135 quarter credit hours for a doctor of philosophy degree. Usually physical education course credits (one per quarter for six quarters) may be added to these minimum requirements in an associate degree program and in a baccalaureate program, although physical education may also be conducted as a student recreational program rather than as part of the instructional program. Oftentimes these minimum credit hour requirements for award of a degree are exceeded, sometimes by as much as 18 credit hours in an associate degree program and by as much as 12 to 24 credit hours in a baccalaureate program. Moreover, the structure of course credits varies a great deal among individual colleges and universities. A desirable kind of standard practice will be outlined later. In spite of these various complications, the figure 15 remains the useful divisor of total credit hours of enrollment for establishing a full-time equivalent student.

The autumn credit hour enrollment divided by 15 provides a full-time equivalent student output measurement for the regular academic year of three quarters. As has been pointed out above, the autumn quarter enrollment determines the production output for which a higher education enterprise must

provide input resources during an academic year. Even though the autumn quarter enrollment is usually the peak enrollment (with some dimunition experienced in the winter and spring quarters), nonetheless, the autumn quarter represents the required production capacity for the whole year. Planning, programming, and budgeting necessarily proceed on this basis.

As has been explained earlier, the summer quarter output represents an additional production effort to that of the autumn-winter-spring quarters. So that the impact of summer outputs might be considered for budgeting purposes along with those of the regular three-quarter academic year, it is useful to add a summer enrollment component to the full-time equivalent count of the autumn quarter. Before such an addition is made, an appropriate weighting of the summer component is required. Since 15 represents the full-time equivalent student for the autumn quarter, and since the regular academic year consists of 3 quarters, a divisor of 45 is used for converting total credit hours of course enrollment in the summer quarter to a full-time equivalent student comparable to that for the regular academic year.

In conclusion, instructional output can best be measured by credit hours of course enrollment, converted into a full-time equivalent student numerical value. Since budgeting of a higher education enterprise is performed for a time period of twelve months (usually July 1 to the following June 30), and since the output of a regular three-quarter academic year

is only part of the twelve months period, full-time equivalent student values for twelve months must include an addition for the credit hours of enrollment in the summer quarter.

Research Output

There is no very satisfactory measurement for the research output of a university. As we have noted, the usual product of a research project is publication of research findings in a research paper or monograph. It is not possible, however, to assign any numerical value to a research paper or to a research monograph. One research paper may represent several man-years of research effort, together with a considerable input of equipment, supplies, and other resources. Another research paper may represent a much smaller investment of manpower and other input resources. There is no way by which the output of the research process can be measured in relation to input requirements on a comparable basis from one research project to another.

Within a college or university, research by a member of the academic staff is of two different kinds. For lack of a better designation, these two kinds of research undertakings are usually titled "individual research" and "separately budgeted research." Individual research describes a research project undertaken by a faculty member on his own initiative and without approval of any other person. Individual research

may and usually does make use of the office, laboratory, library, and other facilities of a college or university. Individual research is a productive effort undertaken over and beyond the instructional work assigned to a faculty member. There is no remuneration as such attached to individual research.

Such individual reserach is an essential part of the role of a faculty member. While not every faculty member in a college or university engages in individual research, he is generally expected to be familiar with the research techniques appropriate to the discipline or professional field in which he specializes; and faculty members who instruct at the graduate level, where research technique is an important part of the instructional program, are expected to be engaged actively in their own research undertakings.

Separately budgeted research is a research project supported by a separate appropriation of funds with which to carry out the research activity. These research funds may be obtained from a variety of sources: appropriation by the board of trustees from the general funds of the enterprise; a grant from a private foundation; a contract from a government agency, a business, or a voluntary association; a grant from a research sponsoring agency of the federal government; an appropriation from state government. The grant or contract specifies the research project to be undertaken and the amount of funds to be spent for conduct of the project. Thus, separately budgeted research usually means that a research project proposal has been

approved by a separate funding agency.

A faculty member may devote a part of his time to instruction and part of his time to a separately budgeted research project. In many instances, the salary to a faculty member will then be derived in part from the instructional budget and in part from the research budget. In some instances, a higher education enterprise will agree to assume the full salary compensation of the faculty member who is the research director or senior research associate of a separately budgeted research project. This compensation may be considered as the enterprise's contribution to the research grant, although there is likely to be a contribution also in terms of facilities (including light, heat, and custodial service). When contributions of these kinds are made to separately budgeted research projects, then the enterprise must devote a part of its general resources to such activity.

Usually most, if not all, direct costs and a part of the indirect costs of a separately budgeted research project will be defrayed from the research grant or contract. The salaries of research associates and assistants, technicians, and other personnel will be provided from the grant or contract. The direct expense of supplies, equipment, and other costs will be provided also from the grant or contract. When the amount of the grant or contract is expended, the research project is concluded, unless a renewal with additional funding is provided from the source of the research financing.

The only output which can be measured in a separately budgeted research project is the total investment or funding committed to the project in a budget period. Thus the research project is in itself the output of research. The inputs are the resources devoted to the project; the technology is the research method or procedure employed in the prosecution of the project. The project itself is the only tangible and definable output which results from the input and the technology devoted to the endeavor.

Public Service Output

The output of the public service endeavors of a higher education enterprise must be stated in the terms appropriate to the varied kind of public services rendered. There is no common measurement or unit of output for so many different endeavors.

Public service undertakings usually have one attribute in common. These undertakings are separately budgeted and are performed to the extent permitted by the resources made available for these endeavors. There is no doubt but that many public service endeavors could be undertaken by colleges and universities; there is no doubt but that many public service endeavors of colleges and universities could be extended to reach more people. Financing -- the availability of input resources -- remains the controlling limitation upon public

service endeavors. Moreover, public service on a sizeable scale may involve the withdrawal of resources from performance of instructional and research programs. This constitutes another necessary limitation upon public service.

The public service output of a higher education enterprise can only be stated for many such activities in terms of dollars expended. In other instances, other measurements are available, but most of these do not tell us very much about the extent of the service rendered.

For a teaching hospital and teaching clinic of a university medical center, it is possible to provide data about patient visits to clinics and about patient-days of hospital care. In addition, it is possible to state the number of interns and the number of residents retained at the medical center who are engaged both in patient care and in advanced medical education. These data, however, do not afford any indication of the kind of medical care and the kind of hospital care afforded patients.

For continuing education courses, it is possible to provide data about the number of persons registered for various short courses and seminars. These courses may range in duration from one day to six weeks, may involve little or much in the way of instructional materials, and may have modest or substantial instructional objectives. There is no generally accepted unit of instructional output for continuing education which affords a standard measurement of output.

For educational radio and television broadcasting, it is

possible to report the total number of hours of programming provided by type of programs: instructional programs, public affairs programs, news programs, drama programs, classical music programs, other musical programs, children's programs. There is no satisfactory means currently available to determine the listening audience for these programs; there are no Nielson ratings by university areas for educational television. Moreover, the expense of broadcasting depends upon the extent of original programming as against use of network programs, upon the power utilized in transmission, and upon the quality and quantity of transmitting equipment.

For consultative services it is possible to provide data about the number of individual clients served and the number of man-days or man-weeks of assistance provided. Here again these data do not tell anyone much about the complexity of the problems which were handled or about the usefulness of the assistance rendered.

For remedial instruction it is possible to provide data about the total number of students who enroll for or seek instructional assistance. Such assistance, however, may be rendered in various ways, in varying degrees of intensity, and for various periods of time. Instructional assistance may take such forms as supplementary course instruction, specialized instruction in study skills, tutorial assistance, and individual counseling. Indeed, all or several of these forms of remedial instruction may be obtained by the same individual

students. There is no common denominator for such assistance other than student contact hours and total number of students served.

In summary, there is very little which can be done in the public service area except to use total dollar expenditures to represent the output of these varied services and to correlate dollar and other input resources with the dollar volume of output.

Auxiliary Service Outputs

Much the same kind of situation exists in connection with auxiliary services. As already mentioned, the most commonly provided auxiliary services are student health service, residence and dining hall service, bookstore service, a student center, a student recreational program, a student cultural program, a student publications program, a student government program, and intercollegiate athletics.

All of these services have only one element in common in the public higher education system of Ohio. Each of these services is expected to be self-supporting in expenditure outlay from direct charges to users of the service, or from a general charge levied upon all students, a portion of which is allocated to the support of each service, or from a combination of these sources of income. The objective of operating auxiliary services which are financially self-supporting means that these services must have income sufficient to meet all current

operating costs, both direct and indirect, and all debt service costs incurred to provide the necessary capital plant.

For a student health service it is possible and necessary to maintain a record of student visitations for clinical examination and treatment, as well as patient-days of hospital care provided. Income for such student health service is obtained from appropriation of a part of the general fee of a college or university and from direct charges to students, these charges usually being paid by a health insurance policy.

For a student center building, there is very little available in the way of output data. I would scarcely be useful to keep a record of students entering the facility. Records would normally be kept indicating the number of meals served by week and month and year, the number of customers in a bowling alley or games area, the number of persons attending concerts or other special events, and the number of persons participating in social activities. These data are useful over a period of time in indicating trends in the work volume of a student center and can be the basis for expanding and contracting program activities in accordance with student interest. These data do not necessarily provide, however, a complete measurement or enumeration of the services provided by a student center.

For a bookstore the dollar volume of sales from text books, trade books, stationery supplies, and other commodities is the most appropriate measure of output for this service. Cost data

in relationship to income by types of books and supplies handled are quite important in determining merchandising practices and space utilization in a bookstore.

For recreational and convocation facilities, similar data may be collected about the numbers of students participating in organized games, utilizing a golf course or other facility, and attending specialized events. These data again do not necessarily afford a full record of the output of these facilities.

For a student publications program, costs and revenue must be evaluated in terms of the contribution of the program to student welfare on a college or university campus.

For a student government program, the activities for the benefit of students must be examined in terms of student interest and student support. Dollar cost and income serve as a measure of output and a guide to decision-making.

For an intercollegiate athletics program, expense and income are factors of considerable importance. Gate receipts may be substantial for football and basketball and negligible or non-existent for other sports such as baseball, track, cross-country, tennis, golf, soccer, swimming, rowing, and wrestling. The expense of coaching, operation and maintenance of facilities, grants-in-aid to student athletes, and other costs must be examined in the light of gate receipts and other income, including appropriation from the general fee. Output must be stated in terms of dollar costs.

Student Aid Outputs

Colleges and universities extend scholarships, grants-in-aid, fellowships, job employment, and loans to students in order to assist them in meeting the individual expense of college or university enrollment. Not all student assistance is necessarily provided through the higher education enterprise itself. Assistance may come directly to the student from voluntary associations, foundations, corporations, and other agencies.

Output can be determined here in terms of the number of students assisted and the average amount of the assistance provided during the fiscal period of one year.

Summary

Output of a higher education enterprise can be determined in a number of different ways appropriate to the particular category of effort undertaken.

1. Instruction
    a. Full-time equivalent student enrollment by autumn quarter plus summer quarter (one-third value), by appropriate program classifications.
2. Separately budgeted research
    a. Dollar volume by projects
3. Public service
    a. Continuing education by projects, number of

enrollees, dollar expense

b. Patient care by numbers served, dollar expense

c. Radio and television broadcasting by program hours, dollar expense

d. Remedial instruction by number of students assisted, dollar expense

e. Consultative services by projects, dollar expense

4. Auxiliary services

a. Student health: number of patients, dollar expense

b. Residence and dining halls: number of students housed, number of meals served, dollar expense

c. Student centers: students and others utilizing selected facilities and services, dollar expense

d. Bookstores: dollar volume by classes of merchandise

e. Recreational and convocation facilities: number of participants by events or facilities, dollar expense

f. Student publications: dollar expense by type

g. Student government: dollar expense by type of activity

h. Intercollegiate athletcis: number of athletes by sport, attendance by sport, dollar expense by sport

5. Student Aid

a. Scholarships: number of students aided, average amoung of assistance

b. Grants-in-aid: number of students aided, average

amount of assistance

c. Fellowships: number of students aided, average amount of assistance

d. Employment: job requests, jobs filled, average compensation earned per week

e. Loans: number of students aided, average amount of loan

PLANNING THE OBJECTIVES OF HIGHER EDUCATION

The purposes of higher education have been outlined in an earlier section. The process of considering, discussing, and deciding upon the actual objectives to be realized by a particular higher education enterprise is planning. Planning means the determination of foals or output. Planning means preparation for action. Planning means the inter-relationship between goals and the availability of resources to meet those goals.

It is easy for individuals and organized groups of individuals to set unrealistic hopes as their achievement goals. These hopes are dreams, not plans. Plans must be possible of accomplishment, or else they delude and frustrate the efforts of people working together. Plans must be possible of accomplishment in terms of available technology, social constraints, and material and fiscal resources.

Planning anticipates change. There may be changes in the environment, changes in population, changes in social expectations, changes in technology, changes in values. It is not easy to anticipate the dimensions of change, but some reasonable effort at forecasting the circumstances likely to prevail in the future is imperative to the planning process.

The most difficult part of planning is to be innovative. Planning is likely to be a projection of the past and of the

familiar unless great effort is made to think in different terms. Sometimes the future is anticipated as growth in magnitude of operations without any change in technology or in objectives. This kind of planning is likely to occur in a higher education enterprise.

Planning involves two inter-related procedures: policy planning and program planning. Policy planning is concerned with value judgments and with commitments to be realized in the operation of an enterprise. Program planning is concerned with the increments of action needed to realize stated objectives and the value commitments of an enterprise. It is illusory to think that value judgments and program plans can be separated into neat compartments one from the other. If explicit value judgments are not clearly set forth as the context of program plans, then implicit value judgments will constitute an important framework of reference for the programs of an enterprise.

Access to Higher Education

The basic planning problem of higher education is the question of access to enrollment. In the United States, higher education is a privilege, not a right. Enrollment is voluntary, not compulsory. Unlike elementary and secondary education between the ages of six and sixteen or eighteen, no one is required by law to attend a college or university.

On the other hand, the privilege of higher education enrollment is an important one, a privilege which has tended to become more important in the past twenty-five years. A two-year technical education, a four-year baccalaureate education, graduate professional education, and graduate education have become indispensable in order to obtain employment in many kinds of work as professional associates and as professional practitioners. It has been technical and professional employment which has been expanding in the American economy during recent years, while employment of unskilled and semi-skilled workers has been declining. Moreover, technical and professional jobs tend to be better compensated than unskilled jobs, although skilled jobs may be compensated as highly as many technical and professional positions.

The question of access to higher education may be approached from different points of view. Inherent in any planning about access to higher education are two value judgments. The first value judgment is that higher education properly expects a certain standard of intellectual and skilled performance on the part of a student. This standard of performance is such that not every person in the population may be expected to achieve that standard. The second value judgment is that access and retention in higher education should be based upon individual merit in terms of intellectual and skilled performance and not upon such other considerations as family, social status, race, religion, or place of residence.

Higher education may set its objectives in terms of individual intellectual development or in terms of the development of educated abilities needed by society, and especially by the labor market of the economy. If the primary objective of higher education is individual intellectual development, then there are questions about how many persons should be provided the opportunity for personal intellectual development and about how these persons are to be selected, according to ability to pay for such opportunity or according to merit and social willingness to meet the cost of such opportunity. If the primary objective of higher education is the development of educated abilities needed by society, then there are questions about how many such persons are needed by various categories and about the resources society will provide for the output of such talent.

With the acceptance of the value judgment that abilities differ within a population and that only certain persons will possess the abilities and the motivation to develop intellectual capacity, there then arises the question of how to identify the individuals who possess the requisite ability and motivation. Essentially there are two choices available in answering this question: (1) to provide open access to higher education enrollment and then after such enrollment and upon the basis of actual performance of the student to determine which students do have the requisite capacity and motivation to complete a degree program; or (2) to make an initial selection

of those who shall have access to higher education based upon past performance, a test of aptitude for a higher education program, or both.

A decision about access to higher education is complicated by circumstances and by limitations of knowledge and technology. Young people from families of sizeable incomes are more likely to enroll in higher education than young people from families of lower incomes. Young people who live near a college or university are more likely to enroll in higher education than young people who live some distance from a college or university. Young people whose parents and friends value higher educational opportunity are more likely to enroll than young people whose parents and friends do not place a high value upon higher education. Young people with a high degree of personal determination to better their social and economic status in relation to the social and economic status of their family are more likely to enroll in higher education than young people who do not possess this personal determination.

We simply do not know the extent to which ability and motivation for higher education depend upon heredity and upon environment. We do not know whether or not race has any influence upon intellectual ability and skills, although there is reason to believe that heredity is a matter of genetic endowment determined by individual rather than racial characteristics. We have some reason to believe that environment does have an important impact upon an individual's ability and

motivation for higher education, but the extent of this impact is not known.

Because the United States has a multi-racial population (Caucasian, Negroid, and Mongoloid) and because the United States has a population of many different ethnic groups (Indian, Anglo-Saxon, Afro-American, Irish, German, Italian, Slavic, Jewish, Spanish-American, Chinese, Japanese, etc.), there has been a question whether or not races and ethnic groups have had equal access to higher education. There has been a concern that inequalities among persons might not reflect differences in abilities and motivation but might reflect discrimination based upon race or ethnic background. There has been a concern, also, that inequalities among persons might reflect disadvantaged economic circumstances based upon the poverty conditions of a family.

As a result of these concerns, action might be planned in order to overcome these disadvantages to some extent. Inequalities of income status may be offset by scholarships, grants-in-aid, and other student assistance programs. Inequalities in environment, including school preparation for higher education, may be offset by remedial or developmental instruction whose objective is to increase the performance potential of students having some promise of ability to do college work.

In some instances, access to higher education means more than academic ability and motivation as such. Other specialized talents may be needed in such programs as those of art,

architecture, music, drama, and intercollegiate athletics. Moreover, not all academic programs require the same kinds of academic abilities; for example, foreign language study requires some facility in the use of language; a speech program requires some facility in public speaking; an engineering program requires some facility in the use of mathematics.

Access to higher education involves not just initial entry at the first year level. It involves entry at the third year level when a student seeks to transfer from a two-year program to a four-year program. Access also involves entry to graduate programs and graduate professional programs.

In Ohio a public college or university is not an autonomous unit in fixing its admission standards and in deciding what students meet those standards. First of all, there are requirements of law to observe. Section 3345.06 of the Revised Code provides that any Ohio graduate of the twelfth grade shall be entitled to enroll in a state-supported institution of higher education without examination. In practice, the state-supported colleges and universities have admitted any student living at home within commuting distance of the campus. In assigning residence hall space for students desiring to enroll on a resident basis -- and it is common practice for universities to require non-commuting students during their first and second years to live in university residence halls and sometimes a university may extend this requirement to women through the third year -- a university may practice selective

assignment to residence hall space. Such selective assignment is justified in terms of maintaining full utilization of residence space.

In addition, some state universities in Ohio are required by law, Section 3345.19 of the Revised Code, to limit the enrollment of the central campus. In such circumstances, the number of students accepted on a residence basis may be further contracted in order to accommodate both commuting and residence hall students within the enrollment limitation.

Enrollment in some programs, like medicine, may be limited by available facilities. Enrollment in some levels may be limited by appropriations. Enrollment in some courses may be limited by available faculty. Limitations for various reasons in varying proportions must be planned within the framework of the college or university as an enterprise.

To some extent access to higher education may be limited by counseling. Some prospective students may be advised that their past record and academic ability test scores suggest a very limited possibility of satisfactory performance in college enrollment. In other instances, a guidance program may seek to advise a prospective student about the instructional program which is most likely to fit the individual's abilities and interests.

There are many continuing issues to be resolved in the admissions process of a college and university. An admissions

plan is an urgent need on every campus, and the admissions plan must be revised every year or two years in order to keep the operation abreast of current circumstances and changing conditions.

Instructional Planning

Instructional planning involves essentially two somewhat different sets of problems. The first and foremost problem is to plan the particular instructional programs which the college or university wishes to offer to students. The second problem is to plan the instructional objectives of the particular program which a college or university does offer. Both sets of problems pose serious issues.

There is a considerable variety of instructional programs available for a college or university to offer. Although we lack a definite taxonomy of instructional programs which is commonly accepted in the United States, the following classification is set forth as useful for planning purposes.

1. General Studies
   a. Associate in Arts in general studies
2. Technical Education
   a. Associate in Applied Science (business technologies, health technologies, engineering technologies, agricultural technologies, government and education technologies)

3. Baccalaureate in Arts and Sciences
    a. the humanities
    b. the social sciences
    c. the biological sciences
    d. the physical sciences
    e. mathematics
4. Baccalaureate in professional studies
    a. agriculture
    b. allied medical professions
    c. architecture
    d. art
    e. broadcasting
    f. business administration
    g. computer science
    h. dramatic arts and dance
    i. education
    j. engineering
    k. forestry
    l. home economics
    m. journalism
    n. military science
    o. music
    p. nursing
    q. pharmacy
5. Master's Degree programs
    a. in arts and sciences

b. in professional studies

c. public administration

d. library science

e. social work

6. Graduate Professional programs

a. dentistry

b. law

c. medicine

d. optometry

e. veterinary medicine

7. Doctoral Degree programs

a. in arts and sciences

b. in professional studies

An individual higher educational enterprise has considerable choice in deciding which instructional programs among these various possibilities it will plan to offer. The actual range of choice may be limited, however, by certain constraints. The nature of the enterprise itself is one possible constraint; a two-year comprehensive community college would offer only two-year programs; a professional school in fine arts would offer only programs in art, dramatic arts, and music. Another constraint may be imposed by the requirement that plans must be approved by some agency outside the individual enterprise itself. Financial considerations of available income may also impose certain restrictions upon expansion of program. Within

these limitations, considerable choice may still remain to an enterprise in determining the instructional programs it desires to offer.

There are many reasons why an enterprise may become interested in offering additional instructional programs beyond those which have constituted the initial enterprise. There may be community needs for additional programs and community pressures to offer additional programs. There may be changing student interests. There may be manpower needs not currently being met on an adequate basis. There may be an offer of funds for new programs from some external source: a business, a foundation, a voluntary association, a governmental agency. And then there are the predilections of professors; it is widely believed in academic circles that the highest prestige belongs to persons who conduct a doctoral degree program. For a variety of reasons, an enterprise may wish to explore the possibility of offering additional instructional programs.

There are three essential factors to be considered in determining the instructional programs to be offered by a higher education enterprise. One is the evidence of need for a new instructional program. The second is the qualifications of the faculty to offer new programs. The third is the availability of the necessary resources to offer the program, including facilities, equipment and library resources, and current operating support. All three deserve the most careful

consideration. It is not easy to determine need; this must be done within the context of data about labor market supply and demand. To be qualified to offer graduate instruction, for example, a faculty member must have demonstrated capacity to conduct research and to assist graduate students in conducting research. No instructional program can be undertaken successfully without the required resources in plant, equipment, and financing.

One additional factor of great importance in instructional program planning is the availability of students. If an enterprise exists primarily to accommodate commuting students -- that is, students whose home is within a certain distance of the enterprise -- then it is necessary to determine the potential number of students in the commuting area who may be interested or can be recruited for a particular program. If an enterprise is primarily a residential one seeking enrollment on a state-wide or regional basis, then there is the question whether or not other enterprises are encountering difficulty in recruiting the enrollment they desire. Presumably in every instructional program there is a "critical mass" in number of students below which it is not economically or instructionally desirable to offer a particular program.

In developing new instructional programs, the prospect of employment for the degree recipient is a matter of great importance. If students seek to enroll in a program, they desire usually some assurances that their educated talents will be in

demand when they have completed their course of study. Unless some careful attention has been given to this matter, a higher education enterprise may be irresponsible in its attitude toward its own graduates.

At the graduate and graduate professional levels of study -- the program beyond the baccalaureate level -- the financial support of the student is becoming an issue of increasing concern. The graduate and graduate professional student may meet the personal expenses of study (including fees and personal living expenses of himself and his family) from one of four sources: his parents or relatives, fellowship awards, loans, or employment. A graduate and graduate professional program open to part-time students encourages the individual to obtain employment to support himself and his family. A graduate and graduate professional program not open to part-time students means that the individual student must obtain his financial support from his parents, from fellowships, and from loans, supplemented by such part-time employment as the student can manage.

Nothing has been said here about the problem of quality in instructional program planning for two reasons. It is assumed that academic planners would always begin their efforts with some minimum objective in the standards they wish to achieve. Furthermore, it is assumed that standards of performance will be considered in connection with every phase of program planning: the facilities needed, the equipment and

library needed, the financing needed, the recruitment and enrollment of students, the course requirements, the degree requirements. A concern for academic quality is not separable from every aspect of program planning.

It is time to turn to the instructional objectives as distinct from the program objectives in higher education planning. Program objectives have to do with the programs to be offered. Instructional objectives have to do with the more precise goals to be achieved within each instructional program. The planning process in higher education does not end when it has been decided that an enterprise shall offer a particular program. This is only the beginning, the first step. Even more vital is the planning of the specific instructional objectives to be achieved by an instructional program.

The essence of the higher educational enterprise is instruction. This fact makes almost incomprehensible the failure on the part of faculties to define with some precision both their instructional goals and their instructional means for achieving those goals. Instruction implies a change in the behavioral characteristics or capacities of the student as an individual. It is essential for an instructional program to begin with certain behavioral capacities in the student and to conclude with certain enhanced, extended, or newly developed capacities. Through careful planning, the possibility of achieving these newly developed capacities can be maximized.

Instructional objectives are ordinarily formulated and realized in increments, and these increments are called courses. The collection of courses which constitute an instructional program is the curriculum. If instructional objectives are to be realized, a curriculum must be carefully integrated; the increments must be additive. If instructional objectives are to be realized, a curriculum must be carefully sequenced; the increments must be cumulative. Too often a curriculum is a random selection of unrelated bits and pieces. This may be useful for meeting the interests and capacities of individual students. But it means that program planners have little confidence in their ability to set definite goals for themselves or to realize those goals.

Instructional objectives are equally necessary for both a curriculum and a course. The curriculum envisages objectives for a program as a whole. A course envisages objectives for a component part of a curriculum. Planning a curriculum and planning a course are related endeavors, but they are also separable efforts. The considerations which affect both kinds of planning are similar and may be discussed as such. At all times it is necessary, however, to bear in mind the appropriate modifications which may be needed depending upon whether or not the focus of the planning is curriculum or a course.

Instructional objectives are threefold: cognitive, affective, and skilled. To a varying extent, these objectives are implicit or explicit in the curriculum and the individual course

which students undertake. It is logical to assume that the more explicit the instructional goals, the more likely it is that these goals will be realized in the performance of students.

Cognitive objectives obviously involve mental acts or thinking. These objectives have been classified in six categories or types: knowledge, comprehension, application, analysis, synthesis, and evaluation. Whether or not this particular classification is the must useful one in establishing performance goals for instruction, some such set of objectives is essential in instructional planning.

Affective objectives involve attitudes and values which are inherent in the instructional process as this is carried out in the United States. The affective attachments which are usually sought through instruction include: respect for knowledge, the superiority of rational over emotional behavior, the importance of individual intellectual achievement, tolerance for conflicting points of view about knowledge and attitudes, commitment to the use of knowledge in the service of men, freedom to explore and consider ideas, and devotion to a society which nurtures both academic freedom and academic support.

The skilled objectives of instruction seek to develop in individuals the capacity to think, to continue their own personal intellectual growth, and to perform with a high degree of competence the work involved in applying knowledge to social needs, whether those needs be instruction, the use of knowledge,

or the improvement of social institutions, social enterprises, and social processes.

Research Planning

The planning involved in university research activity is usually of two kinds. First, there is the matter of the financial resources which may be made available for research activity. Secondly, there is the determination of the particular kinds of research assistance or of the particular research projects to support. Both kinds of research planning require careful attention.

Research on an individual basis within a university can be encouraged in a number of ways. When new buildings are constructed, research facilities may be included. The library needs of a faculty member's special field of interest may be built up over a period of time. The instructional load of a faculty member may be reduced in order to provide more time for research. The salary commitment to a faculty member may be divided between the instructional budget and the research budget. Periodically a faculty member may receive a research appointment or a research leave to provide time in which to pursue a research interest. A research budget may provide special travel, special equipment, or special personal assistance funds which can be allotted to the research projects of individual faculty members. A research budget may also provide publication subsidy for research undertakings.

The research budget of a university is the determining factor in fixing not only the amount of resources available for research support to faculty members but also the scope of the various forms of research assistance a university can provide. From a planning and a budgeting point of view, the forms of research assistance provided within available research fund limitations should maximize research activity on the part of faculty members. It is necessary to obtain some factual evidence as well as judgment about the forms of research support which do appear to provide the greatest amount of research encouragement.

In its research planning, a university may also consider whether or not it desires to gain a reputation for research productivity in some particular field of knowledge: the behavioral sciences, the biological sciences, the physical sciences, or some professional field. In some instances, a university may not have any special research objective but rather may seek to encourage individual talent wherever it appears among the faculty members recruited for instruction in the disciplines and professional fields. In other instances, a university may determine through its planning process that it desires to promote research competence in a particular field of study and to maintain a general instructional competence in other fields. Such a decision might be made upon the basis of judgment that greater research accomplishment will be realized from a concentration of limited resources

rather than from a wide distribution of such resources.

When research support is obtained from foundations, corporations, state governmental appropriations, and federal governmental agencies, a university must still determine whether or not the support offered will meet all direct and indirect expense of the research project. If the university is expected to provide all or a part of the indirect expense, for example, this cost item must be included in the research budget of the university. There is no such thing as an activity which does not "cost" a higher education enterprise some outlay, direct or indirect, overt or hidden. The cost may be worthwhile to a university in recruiting and retaining faculty members, in building special competencies, in gaining academic recognition.

When the research objectives of a university have been decided upon, there still remains the task of dividing available research resources among individuals and projects. This may be essentially a budgeting procedure. At the same time, the research resources must be continually examined in terms of the results produced, the outputs of the research effort of the university. As has been pointed out earlier, it is exceedingly difficult to determine just what the outputs of research may be. Research planning has little if any validity, however, unless some determination of measurable results can be made. This is the continuing challenge to the research planner.

Research is more than the accumulation of knowledge. Research findings must be incorporated into instruction if instruction is to keep abreast the discoveries of knowledge. In addition, research must be made known to the other institutions of society -- the economy, the polity, the professions, the voluntary groups -- which may utilize knowledge in the solution of stubborn social problems. This kind of external transmission of research results is a possible public service activity of a university. Research planning cannot be indifferent to the possibility of practical need. It seems likely that social support of research activity will tend to be most generous when practical need is a major objective of research planning.

Public Service Planning

In the continuing education part of higher education public service, the principal objective is that of bringing professional practice up to date with the latest knowledge and techniques of action. As in the planning of instructional programs, the planning of continuing education programs demands a careful concern with specific goals of professional behavior to be achieved by these programs. Presumably these goals are also cognitive, affective, and skilled.

In providing client services, a higher education enterprise seeks objectives incidental to those of the instructional

activity. To be sure, client welfare must be a major consideration at the same time when service to clients is part of the procedure by which students acquire experience and skill in professional practice. There is a continuing conflict in this area of public service, however, between community needs and instructional needs. A limited case load or patient load may be desirable for instructional purposes; community needs for medical, dental, nursing, speech therapy, and other services may be so great as to discourage desirable limitations upon case or patient load. Careful planning again is indispensable in these circumstances.

There are planning problems in connection with other public service activities as well: in public broadcasting, in consulting services, in technical services. In every instance the objectives in terms of output in both qualitative and quantitative aspects require foresight and preparation. It should be emphasized here again that evaluation of actual accomplishments realized is an important element of planning.

Planning Auxiliary Services

A higher education enterprise may provide housing for all, a major part, a small part, or none of its students. The idea of student housing in connection with a university was probably part of both the medieval and the religious heritage of higher education. In a predominantly rural society such as

that of the United States during the Eighteenth and Nineteenth Centuries, student housing was needed in order to bring together a student body. In a predominantly urban society such as that of Twentieth Century America, student housing is less essential except for youth who wish to live away from home.

It has long been traditional that student housing ought to be an integral phase of instruction; the ideal has been that of students studying and living together. In practice, the tradition has been little evident in actual behavior, and the ideal has seldom if ever been realized. Students living together are usually more interested in their own social concerns and needs than in their intellectual growth.

Student housing has often served another objective in the United States: to help bridge the difference between secondary education and higher education.. In general, the academic performance standards expected of the undergraduate student may be considerably higher than those expected of the high school student. Moreover, if the high school student has needed the supervision of parents in meeting academic performance expectations, who is to provide such supervision for the college student living away from home? It has not been unusual for the freshman student, freed from general parental oversight, to find his new social freedom so exhilerating that academic performance suffers. Student housing may then serve as a bridge between family discipline and individual discipline in

meeting the academic performance standards of a college or university.

Whatever the objectives of a student housing program, these objectives need to be formulated with care and programs devised to make certain that these objectives are achieved.

The same observation may be made about other auxiliary services: student health, student recreation, student social activity, student cultural activity, student government, and intercollegiate athletics. All of these endeavors become meaningful only as their objectives are formulated in some detail and if means are devised which are reasonably calculated to meet those objectives.

Planning Student Aid

The objectives of a student aid program are not always clarified to the extent which is desirable. In essence, the choice is between recruitment of talent and the equalization of access to higher education. Many higher education enterprises are primarily interested in the recruitment of highly promising persons: persons with talent as students and scholars, with talent in specialized fields such as dramatic arts and music, and with talent as student athletes. Talented persons contribute in many ways to the record of an enterprise in producing graduates of superior ability and performance. Since talented persons are at best somewhat difficult to find, there

is apt to be considerable competition for students of special promise. Student aid may be a reward or a recognition of past achievement and an expression of confidence in future performance. Student aid may be a means of persuading students of talent to enroll in one college or university in preference to another.

Student aid is also important in providing to students the economic resources which they require in order to enroll in a college or university. Just as talent is not distributed equally among students, so economic resources are not distributed equally. Some students come from families of comfortable or substantial income; other students come from families of meager income, indeed, from families which need the earnings of the student in order to maintain themselves. Student aid is then a means for increasing the economic resources required by some students in order for them to enroll in higher education.

The student aid objectives of a higher education enterprise are apt to fluctuate between these two positions. Some resources will be used to recruit talent. Other resources will be used to equalize access to higher education. The enterprise must fix its objectives and provide its resources as it deems appropriate to its circumstances.

Summary

Planning is a process of rational endeavor, of fixing goals for individual and social effort and seeking to accomplush those goals with the available resources.

The planning process consists of certain general and familiar procedures:

1. Review and analysis of current conditions and a formulation of basic purposes.
2. Determination of objectives to be realized in order to accomplish the basic purposes of the enterprise.
3. An inventory of current resources for accomplishing the desired objectives.
4. The development of programs for accomplishing desired objectives.
5. The modification of programs within limitations of available resources.
6. Continuing evaluation of progress in accomplishing the desired objectives.
7. Continuous planning in the light of changing circumstances, changing purposes, changing objectives, and changing resources.

PROGRAMMING THE OUTPUT OF HIGHER EDUCATION

The critical step in planning is programming. Plans have little meaning other than that of an intellectual exercise until they are translated into programs. Programs are essentially work-loads. Programs set forth the output to be realized in a given time period, usually a budget time period. Programs set forth the resources to be consumed by the work process needed to produce the established outputs.

Programming is not incremental but comprehensive. The impact of a program in a given time period may be incremental in the sense that it adds to a previously existing stock of output and that it advances the enterprise toward a long-range set of output objectives. But a program in any one particular time period sets forth the entire output of that time period, not just the increase in output over the preceding time period.

Programming is closely inter-related with budgeting. It is difficult to draw any sharp distinction between the two processes, except to point out that programming emphasizes outputs in the production process of an enterprise, while budgeting emphasizes inputs in the production process. Necessarily the output of a program is a function of the inputs. There is a continuing need for adjustments between program and budget, between outputs and inputs.

The programs of a higher education enterprise are the specific outputs for an academic year which result from the

planning process and from the budget process. Programs in the sense in which that word is used in this section are the outputs which can be produced by the available financing of the enterprise.

Instructional Programs and Academic Departments

It has been pointed out earlier that the organizational structure of most higher education enterprises complicates the programming effort. The academic department which is the operations unit of the higher education structure produces course outputs rather than program outputs. Program outputs are the concern of the program management units of the higher education structure. The academic department in a university may provide courses for several different programs. This multi-program characteristic of the academic department is one which requires identification, recognition, and appropriate accommodation.

In the preceding section on planning, a six-fold classification of instructional programs was presented. Within these major categories are numerous particular programs, some of which (like the Doctor of Medicine program) may be more complicated and more expensive than a whole category of related programs. For each of these instructional programs, one or more academic departments may provide one or more sets of courses. For each academic department it is essential that

the department know exactly what it is supposed to produce for each program to which it contributes. In the absence of such knowledge, operations programming at the level of the academic department is bound to be faulty.

Instructional programming involves two somewhat separate determinations: course offerings and enrollment load. Too often course offerings are likely to reflect the personal interests of individual faculty members rather than an orderly sequence of learning aimed at specified cognitive, affective, and skilled objectives. To be sure, the learning goals of each instructional program are different one from another, at least in certain details. And individual students have somewhat different learning goals. But it is reasonable to expect that an instructional program (for example, a master's degree in economics or a doctor's degree in physics) should have a definite set of goals and a definite sequence of learning progression toward those goals.

It is equally indispensable that for every program there be a reliable estimate of course enrollments, that is, of full-time equivalent output. Here again, there are difficulties in forecasting. Student interests change. The record of the past year is not necessarily an accurate base upon which to project the output for next year. In spite of these complications, however, it should be possible to make reasonably accurate estimates of course enrollments by departments in terms of the total enrollment expectations of the higher education enterprise,

the projected distribution of this enrollment by programs and by level of offerings.

It is essential to bear in mind that students enroll in programs which have a specific set of course and credit hour requirements. If a student is enrolled and is accepted in a program, then the departments which contribute course offerings in that program have an obligation to provide those courses which are required. Such courses must be provided in such ways as to accommodate enrollment demand. If the resources in staff and facilities are not available to accommodate enrollment demand, then enrollment in a program should be reduced. The best interests of neither the student nor the enterprise are served when students are enrolled in an instructional program but are unable to obtain the course enrollments required by that program.

It may be well to refer here to the earlier discussion about instructional technology. An important part of instructional programming is to establish the technology to be utilized in producing the planned outputs of an individual course offering or of a sequence of course offerings. For example, certain courses may be offered upon the basis of large lecture sections taught by a senior professor, supplemented by discussion sections led by teaching assistants. Or certain courses offered in multiple sections with a maximum enrollment of 25 students may be taught by a ranking faculty member who also supervises a group of teaching assistants working with him.

There are, of course, many other methods or techniques of instructional procedure. The decision about the technology appropriate to the course and to the resources available is a major ingredient in instructional programming.

Programming Courses for the Associate Degree

The higher education enterprise, college or university, offering two-year degree programs usually provides two types of degrees: the associate in arts and the associate in applied science. The first program is one of general studies, consisting of courses providing 90 quarter credit hours distributed among the humanities, social studies, biological sciences, physical sciences, and mathematics. These courses may have a special focus upon community problems, or they may be oriented toward certain professions. Indeed, general studies may include preprofessional introduction to teacher education or business administration. The second program is that of technical education, which prepares individuals to work as professional associates in the business technologies, health technologies, engineering technologies, agri-business technologies, and government-education technologies.

In general studies the course offerings are of two kinds: (1) introductory courses which explore the general concepts of a specialized field of knowledge and (2) core courses which provide some more detailed study of certain sub-specializations

of a discipline. In a technical education program, the course offerings will ordinarily be drawn about 50 percent from general studies (including introductory courses and others providing background for a particular technology), with the other 50 percent constituting specific technical courses designed to prepare a person to work as a professional associate.

In programming a technical education curriculum, it is essential to maintain close relationships with the professions or businesses which employ professional associates. In this way it is possible to ensure that the knowledge and skills produced by a curricular program are those needed by employers. Such close relationships also facilitate the placement of technical education graduates when they have completed their program of study.

In both general studies and technical education, programming necessarily includes determination of course enrollments and of appropriate instructional methods. The full-time equivalent student enrollment in courses and programs in turn determines the necessary inputs for these programs in turn determines the necessary inputs for these programs.

Programming the Baccalaureate in Arts and Sciences

A baccalaureate program in arts and sciences usually consists of two parts: a general studies component and a specialized studies component. The individual students selects his

specialized field of study, a particular foreign language and literature, history, psychology, pre-law, the biological sciences, pre-medicine, chemistry, physics, mathematics, or some inter-disciplinary area such as American studies or Black studies.

The purpose in general studies has been defined as breadth of knowledge, as encouragement to the student do develop a general understanding of the great scope of man's knowledge, a general understanding of man's intellectual heritage in Western culture, and a general understanding of the value commitments of Western society. To the context of Western culture, a university may wish through general studies to add for each student an acquaintance with at least one other culture, such as Oriental culture, Islamic culture, or African culture.

The broad purpose of general studies in a baccalaureate program in the arts and sciences is relatively simple to state. To define this purpose in more concrete or specific terms and then to program a course of study to achieve these objectives has proven especially difficult for almost every university. Some colleges and universities have been on the verge of abandoning any general studies objectives entirely, partly because they have found the effort to define and realize these objectives beyond the power of the faculty, and partly because they have thought it likely that secondary education could and should undertake this purpose.

Whatever planning a higher education enterprise does in

the field of general studies, the programming of the plan presents a substantial challenge. The departments which contribute to the general studies program must design certain courses which are calculated to achieve the objective of providing students with a general understanding of a field of knowledge. Moreover, in such programming it is essential to define objectives in general study which are different from the objectives in specialized study.

In programming courses for general study objectives, it is cusomary for academic departments to offer the two kinds of courses mentioned earlier: (1) introductory courses and (2) core courses. Often a student may omit one or more of the introductory courses through successful achievement on an advanced placement test. Oftentimes a student in his specialized field of interest may have specialized introductory courses considerably different from the introductory courses designed for general study objectives.

Because of the nature of academic development and academic technology in the past thirty years in the United States, specialized study has been cultivated with considerable vigor. Indeed, the basic programming problem has been to keep specialized study in a discipline at the baccalaureate level within some reasonable limits. There has been a tendency for specialized courses to be quite numerous and to be available to upper division students and to graduate students on an almost interchangeable basis. In this development a clear distinction

between specialized study at the baccalaureate level and specialized study at the master's degree level has almost disappeared.

In programming courses for specialized study, there is an additional problem to that of keeping the specialized courses within certain limits appropriate to the baccalaureate objectives. This other problem is to determine what specialized courses in related disciplines it is desirable to encourage students to study as a part of their special interest. It is highly desirable for students of American language and literature, for example, to acquire specialized knowledge about American history and American sociology. It is highly desirable for students of American history to obtain substantial knowledge about economics, sociology, government, and social psychology. It seems desirable for planners of academic programs at the baccalaureate level to set for themselves objectives of an inter-related scope of knowledge rather than objectives of a highly specialized and detailed knowledge.

The place of mathematics in an undergraduate curriculum presents another kind of concern. Mathematics is a discipline in its own right. But mathematics is also an analytical technique of importance to the physical sciences, biological sciences, and behavioral sciences. Mathematics is also extensively used in engineering, computer science, and other professional fields of study. Statistical analysis is closely allied to applied mathematics. In consequence, mathematics

courses involve instruction to a wide variety of students whose use of the knowledge tends to be quite different from program to program. These various needs for mathematics instruction have to be accommodated in various course offerings.

Baccalaureate Professional Planning

There are many fields of professional study at the baccalaureate level, from agriculture, architecture, and engineering to teacher education, business administration, and nursing. There are two problems in common which trouble directors of professional programs of instruction. One is the extent of the general studies component which shall be included in a professional program. Because of increased knowledge to be applied in professional practice, departments and schools offering professional programs tend to resent any degree requirements not directly related to the immediate objectives of professional education. Secondly, there is the question about how to incorporate professional experience in a program of professional education. The two most widely used methods for developing such interrelationships involve cooperative study (alternating periods of study and apprenticeship) and internship.

Colleges offering professional programs which include a general studies component tend to desire that these general studies be oriented specifically toward their professional objectives. Thus an undergraduate engineering program, for

example, is apt to be designed to include general studies courses in English, economics, and mathematics which will be particularly relevant to the interests of engineers. An undergraduate program in teacher education is apt to be designed to include general studies courses in psychology, history, and science which will be particularly relevant to the interests of teachers. These special professional concerns with general studies deserve consideration and some accommodation in departmental programming.

Professional education is by definition specialized education. In programming the specialized courses for particular professional fields, there is a danger of over-specialization, of sub-dividing areas of professional interests into numerous bits and pieces which lack coherence and overlap one another in content. Only careful planning of instructional objectives and careful programming of courses to achieve those objectives can reduce this danger.

Programming Graduate Professional Instruction

The programming concerns of graduate professional instruction are in many ways somewhat simpler to resolve than those for undergraduate professional instruction. There is a tendency to consider the undergraduate education not just as pre-professional but as being comprised entirely of general studies. As a result, the graduate professional school can concentrate

attention entirely upon professional instruction without concern for a general studies component. This means that the programming of graduate professional instruction has concentrated upon the achievement of professional objectives.

There is no common pattern which can be expected in the programming of graduate professional education. There are the usual problems of the extent of specialization to be sought in these programs and of the role of professional practice as an integral part of professional education. The time period for realization of professional education objectives may vary from three to four years.

It is important that such programming be clearly developed and that the programs pursued be clearly calculated to achieve stated objectives of professional education.

Programming Graduate Instruction

Graduate education other than separately organized graduate professional education is of two kinds and is conducted at two levels of achievement. Graduate education embraces the disciplines of the arts and sciences and also professional fields of study. Such graduate education is built upon the base of a baccalaureate education in a discipline or in a professional field of study. Thus graduate education as commonly defined in the United States includes graduate study in engineering, in teacher education, in nursing, in business administration, and other professional fields in addition to graduate

education in the arts and sciences.

Graduate education is conducted at two levels: at the master's degree level and at the doctoral degree level. Presumably there is supposed to be a sharp or at least a definite distinction between the two levels of instruction. Presumably there are different instructional objectives in a master's degree program from those in a doctoral degree program. This difference is an important item of instructional planning, and, in turn, the difference in objectives must be reflected in instructional programming.

If we may assume that a clear distinction has been developed between a master's degree program and a doctoral degree program, we may envisage a master's degree program constructed along the following course requirements:

1. Specialized courses providing detailed knowledge of a particular part of a discipline or professional field (30 quarter credit hours)
2. Seminar in the philosophy of knowledge appropriate to a discipline or professional field (15 quarter credit hours)
3. Preparation of an essay or conduct of a work project indicating special competence in the discipline or profession (15 quarter credit hours)

If we may assume that the objectives of a doctoral degree program are formulated in terms to achieve a high degree of

intellectual or professional mastery of a field of study, we may envisage a doctoral degree program constructed along these lines:

1. Specialized courses providing detailed knowledge (30 quarter credit hours)
2. Seminar in research method (5 quarter credit hours)
3. Seminar in instructional method (5 quarter credit hours)
4. Seminar in scope of discipline or profession (5 quarter credit hours)
5. Research project or project in application of professional skill (45 quarter credit hours)

Programming Research

Programming the research activities of higher education is essentially the process of laying out a procedure for executing a research project. Once a research project has been approved within the research planning procedure of a university, the director of the project confronts the task of fixing the work steps to be accomplished in the execution of the research design. These work steps will reflect the technology to be employed in the particular research undertaking.

The work steps of a research project are those appropriate to the nature of the inquiry, the technology available for achieving the desired goals, and the resources available for

pursuing the desired goals. The work steps may be modified as the project proceeds, to be sure, but when this occurs, new work steps are devised to take their place.

Research programming has one of two primary goals: (1) to accomplish as much in the accumulation of facts, analysis, and synthesis as possible with the resources provided for the project; or (2) to complete the planned objective and to publish the findings and generalizations resulting from the work effort. Much research is unlikely to result in any substantial addition to knowledge; the research may provide only negative findings. There are no guarantees of research output other than the incidental usefulness of the project itself in terms of its planning and programming.

Because research output is so uncertain in the case of most research projects, research programming is primarily preoccupied with maximum utilization of the resources provided for the project. Programming under these circumstances is not only a highly individualized effort of the project director; it is also a process of consuming inputs without any assurance of measurable or identifiable outputs other than the project itself.

Research is performed by faculty members, with possible assistance from research associates, research assistants, technicians, and secretarial and clerical personnel. Usually senior research staff of an organized and separately budgeted research project will also be members of an academic department. This

means that departments must program that a certain proportion of their staff and facility resources will be devoted to research activity. In other instances where research work is highly individualized, an academic department may wish to program a part of the work assignment of a faculty member to research effort rather than to instructional effort. The extent of such programming is an important part of operations management at the department level in a higher education enterprise.

Programming Public Service

The varied nature of the public service activities of higher education has been mentioned several times. For such different kinds of endeavor no one programming procedure is possible. Rather, programming must proceed according to the particular characteristics of each individual public service undertaking.

In the instance of continuing education projects, the programming is concerned not with the award of degrees or even of course credits toward degrees. Rather, the programming is concerned with accomplishment of certain specific objectives of instruction intended to provide the student participants with a particular kind of new knowledge, insight, or skill in their professional practice. The programming of material to be presented by a particular means of communication is intended to achieve these objectives.

In the instance of medical and hospital service provided by an out-patient clinic or a teaching hospital of a university medical center, programming involves patient care according to the nature of the illness or disease and according to the available technology for curing such illness. The established procedures for diagnosis and treatment constitute the essential programming, with the case load becoming the unknown circumstance which may complicate the patient care provided.

In the instance of public broadcasting, programming is literally the production and transmission of particular kinds of programs: music (of different kinds), discussions, news, drama, lessons. The programs broadcast are those which accomplish the general purposes of the broadcasting plan and which are made possible by the resources available.

Public service programming is thus primarily a work process. It involves determination of the extent and volume of public service activity to be undertaken by a higher education enterprise.

As with research, public service of a college or university is performed by faculty members. This means that public service programming must be done by academic departments and must be considered a part of the operational work load of these departments. The academic resources of staff and facilities in any higher education enterprise can scarecely be extended to instruction, research, and public service without

careful programming.

Programming Auxiliary Services

The variety of auxiliary service activities of higher education presents another considerable assortment of programming techniques, from the scheduling of athletic contests and the coaching of student athletes for participation in these contests to the preparation of meals for students in accordance with a carefully determined menu program. Such divergent types of activity can only be summarized in cursory fashion or be considered in comprehensive detail.

It is sufficient for present purposes simply to emphasize that programming is a necessary procedure in every kind of auxiliary service performed within a higher education enterprise. Every such activity requires both a plan in terms of objectives to be realized and a program in terms of the means appropriate to accomplishment of the defined objectives. These programs deserve just as careful attention as those connected with all other activities of a college or university.

Programming Student Aid

Student financial assistance may seek to accomplish its avowed purposes of recruiting special talent or of equalizing educational opportunity through certain very well know programs: scholarship awards, grant-in-aid awards, fellowship

awards, part-time employment, and loans. Each such program may involve definite procedures: submission of an application, review and decision on competing applications, the calculation of income need, the listing of employment jobs, and the referral of individuals to appropriate openings, the execution of loan agreements with their repayment schedules.

Financial assistance programs depend upon financial resources, as has been pointed out before. But financial assistance programs also depend upon extensive personal interviewing and the effort to make each award appropriate to the circumstances of the individual applitant. These procedures determine whether or not there is a sense of personal interest and concern evident in the handling of every individual seeking financial assistance.

No set of student assistance programs is likely to meet all the circumstances of financial need which students will present to an enterprise. A large part of such programs consequently entails the denial of assistance, not because a student's abilities or needs are in doubt, but because the necessary resources are simply not available. Thus student assistance programs are confronted with the continuing problem of denial of assistance.

Programming student assistance involves timeliness. Applications must be handled on some definite time schedule if assistance is to be helpful to individual students. Inability

to program a given work load of applications for assistance can result in a denial of such assistance. Thus student assistance programming is a matter of careful scheduling.

General

It is impossible in this discussion to review every process or activity of a higher education enterprise. Yet every such process and activity involves programming as a work procedure. There is no part or phase of a higher education enterprise which does not demand careful programming as a means to effective and efficient work performance.

The particular items singled out for mention here are illustrative, not complete in their enumeration. There are many other activities which might have been explored, such as the scheduling of classroom use, the processing of student records, the collection of accounts receivable, the repair of equipment, the maintenance of buildings, the utilization of computer equipment. All of these activities have programming needs and programming procedures.

Summary

Since the principal focus of attention in this manual is upon planning, programming, and budgeting for the instructional activities of a higher education enterprise, we may properly return once again to this subject in this summary.

Instructional programming has an operational aspect and a program aspect. Since academic departments conduct courses and since divisions, schools, or colleges offer degree programs, programming of courses must be performed by departments and programming of curricula must be done by divisions, schools, or colleges. Obviously both kinds of programming, the operational and the curricular, are closely interrelated. The standards of curricular programming should fix the framework for course planning by departments.

An instructional program eventuating in award of a degree is, of course, a curriculum, or a curricular program. A curricular program is frequently complicated by the inclusion of a certain number of so-called "elective" courses which may be selected by a student in order to complete the course requirements for a degree. Whether or not as extensive a range of choice is desirable as is sometimes permitted is a question to be resolved by curriculum planners.

We may illustrate a curriculum program by the attached Table A. Programming begins when the total number of students by student credit hours of output is calculated for such a curriculum. In order to make such calculations, program management (a division, school, or college) must forecast the total number of students to be admitted to the program and the distribution of these students by year (level) and by courses.

In the accompanying illustration we are not proposing a

model or standard curriculum; we are simply setting forth a curriculum which might result from program planning and which would be the necessary beginning of course programming. There would necessarily be such a curriculum for every instructional or degree program offered by a particular higher education enterprise. In a university there might well be one hundred or more such curricular programs.

In turn, an academic department must establish a program of course offerings as the basis for its own instructional output. A complete program of departmental operations would include the outputs of research and public service in addition to those of instruction. Table B is a hypothetical and illustrative departmental program for instructional activities. This illustration indicates the various courses required of a department to support different instructional programs: general studies, the baccalaureate program, the master's degree program, and the doctoral degree program. Furthermore, the illustration suggests the instructional output in course credit hours which such an array of courses might be called upon to produce.

It is the output of such courses by programs which fixes the input requirements and the technology requirements (instructional procedures) which an academic department must be prepared to provide. Only by programming such outputs can departments and colleges proceed to determine budget needs.

Table A

Curriculum Programming Data

Curriculum: Elementary Education

Student Input

First year: 700
Second year: 600
Third year: 400
Fourth year: 400

	Credit Hours Per Quarter			Student Credit Hours Per Quarter		
	Autumn	Winter	Spring	Autumn	Winter	Spring
First year						
American Language	3	3	3	2100	2100	2100
General Biology	4	4	4	2800	2800	2800
General Psychology	3	3	3	2100	2100	2100
American History	3	3	3	2100	2100	2100
Fundamentals of Music	2	-	-	1400	-	-
Fundamental of Art	-	2	-	-	1400	-
Fundamentals of Health Education	-	-	2	-	-	1400
	15	15	15			
Second year						
General Mathematics	3	3	3	1800	1800	1800
General Science	4	4	4	2400	2400	2400
General Geography	3	3	3	1800	1800	1800
General Government	3	3	3	1800	1800	1800
General Sociology	3	3	3	1800	1800	1800
	16	16	16			
Third year						
Introduction to Education	3	3	3	1200	1200	1200
Language Arts and Children's Literature	3	3	3	1200	1200	1200
Teaching the Social Studies	3	3	3	1200	1200	1200
Teaching Science and Arithmetic	3	3	3	1200	1200	1200
Teaching Art and Music	3	3	-	1200	1200	-
Teaching Health and Physical Education	-	-	3	-	-	1200
	15	15	15			

Fourth year

History and Philosophy of Education	3	3	-	1200	1200	-
Sociology of Education	3	3	-	1200	1200	-
Speech Functions of Teacher	3	3	-	1200	1200	-
Curriculum Planning	3	3	-	1200	1200	-
Child Guidance and Development	3	3	-	1200	1200	-
Internship	-	-	15	-	-	6000
	15	15	15			

Table B

Instructional Programming Data

Instructional Department: Government

Course Level	Title	Credit Hours Per Quarter Autumn	Winter	Spring	Student Credit Hours Per Quarter Autumn	Winter	Spring
100	General Government	3	3	3	2100	2100	2100
200	American Government	3	3	3	1200	1200	1200
200	International Affairs	3	3	3	1200	1200	1200
200	Comparative Government	3	3	3	300	300	300
200	Political Theory and Public Opinion	3	3	3	300	300	300
300	Political Parties	3	3	3	150	150	150
300	State Government	3	3	-	90	90	-
300	Local Government	-	-	3	-	-	90
300	U. S. Foreign Policy	3	3	3	300	300	300
400	Public Administration	3	3	3	75	75	75
400	International Organization	3	3	3	60	60	60
400	Governments of Western Europe	3	3	3	60	60	60
400	Government and Science	3	-	-	60	-	-
400	African Politics	-	3	-	-	60	-
400	Ohio Government	-	-	3	-	-	60
500	Classical Political Thought	3	3	3	30	30	30
500	Recent Political Thought	3	3	3	30	30	30
500	Political Behavior	3	3	3	30	30	30
500	Constitutional Law	3	3	3	30	30	30
500	International Law	3	3	3	30	30	30
500	Russian Government	3	-	-	30	-	-
500	Asian Government	-	3	-	-	30	-
500	Latin American Government	-	-	3	-	-	30
500	The American Executive	3	-	-	30	-	-
500	The Legislative Power	-	3	-	-	30	-
500	The Judicial Power	-	-	3	-	-	30
500	Bureaucracy and Power	3	-	-	30	-	-
500	Administrative Law	-	3	-	-	30	-
500	Public Management	-	-	3	-	-	30
600	Concepts of Power	3	3	3	30	30	30
600	Master's Essay	15	-	-	30	30	30
700	Research in Political Behavior	5	-	-	30	30	30
700	Research in Administrative Behavior	5	-	-	30	30	30
700	Research in Comparative Government	5	-	-	30	30	30

700	Research in Political Theory	5	-	-	30	30	30
800	The Study of Government	-	5	-	-	30	-
800	Teaching of Government	-	-	5	-	-	30
900	Research in Government	15	15	15	45	45	45

BUDGETING THE INPUTS FOR CURRENT OPERATIONS

Budgeting is a procedure for converting programs of an enterprise into the common denominator of dollars; it is a procedure for relating varied program inputs to program outputs. Budgeting is a method of determining the outputs to be achieved from available resources and an available technology. Although budgeting is concerned with resources, with inputs, the importance of budgeting lies with the outputs, the products provided by each program of work effort.

In a higher education enterprise, budgeting as a process is necessarily organized around the basic activity areas of a college or university: instruction, research, public service, auxiliary services, and student aid. Within these activity areas are various programs whose outputs and inputs must be brought together in a budget which utilizes resources for production.

Our attention here will be concentrated primarily upon the program budgeting of instruction. Only incidental attention will be given to the budgeting necessary in other activity areas of a higher education enterprise.

Budget Inputs

In all budgeting there are certain familiar categories of input or of objects of expenditure which are employed.

These categories may be summarized as follows:

Personal Services

Salaries

Fringe benefits (retirement, insurance, sick leave, other leave, etc.)

Other Expenses

Supplies and Equipment

Travel and Other

Contract services (utilities, rent, etc.)

Printing and Reproduction

Obviously these objects of expenditure do not have any meaning in and of themselves. Objects of expenditure are means to an end. The problem of program budgeting is to relate input resources to output objectives.

There is still a further budgeting complication for a higher education enterprise. Objects of expenditure can be determined at various levels of management: the operations level, the program level, the enterprise level. As we have noted already, for instructional activity the operations level is usually the academic department. The program level is often a division, school, or college. The enterprise level is the college or university as a whole. Each of these levels of organization have input calculations to make for the instructional budgets., It is necessary to examine the role of

each level in the development of a program budget for instructional activity.

Departmental Instruction

As has been observed earlier, an academic department as the operations unit of a higher education enterprise tends to think of its instructional effort in terms of course offerings rather than in terms of program offerings. A program approach to budgeting rather than a course approach requires a new kind of budget thinking within academic departments, as well as within a higher education enterprise as a whole.

As a beginning, the academic department, as noted in the preceding section, needs to identify its course offerings in terms of their contribution to and participation in the approved degree programs of the enterprise. For a department specializing in an academic discipline (such as German language, sociology, or chemistry), this may mean there will be course offerings in as many as four different programs: general studies, baccalaureate, master's degree, and doctoral degree.

In addition, for each course offering or set of program course offerings, the academic department must establish a technology, a learning procedure. This technology in large part determines the input requirements for the instructional budget. Technology involves class size, instructional method, and instructional support. The controlling effect of technology

can be illustrated by several examples. For reasons of convenience and some familiarity, we may use a Department of Government in this illustration.

Let us assume that the Department of Government, in conjunction with program management, has determined that its general studies course entitled "General Government" or "Introduction to Government" will have an autumn quarter enrollment of 2100 student credit hours. If this is a three credit hour course, we know that there will be 700 students to be accommodated in this course. The problem of technology for this course is the determination of the instructional procedure for producing 2100 student credit hours per quarter for these 700 students.

There are a number of different instructional procedures which might be utilized for this course. Let us look at just two possible methods. First, the department may decide that the 700 students should be instructed in discussion sections of 25 students each. This means that the department will have to offer and staff 28 sections of this course. If we assume that a full-time instructional load for a faculty member is four sections or 12 credit hours, then this work-load standard means that seven full-time equivalent instructional staff persons will be needed to produce the necessary instructional output. Or, the department may decide that the 700 students should be instructed in four large lecture sections of approximately 175 students each for two hours a week, supplemented

by 28 discussion sections of 25 students each meeting one hour per week. With the same work-load standards as employed in the first process, we now find that three full-time equivalent staff persons will be needed to produce the necessary instructional output.

The budget aspects of these two different instructional technologies may be summarized as follows:

Student Credit Hours	2,100	2,100
No. of Lecture Sections	--	3
No. of Discussion Sections	28 (3 hours)	28 (1 hour)
F.T.E. Instructional Staff	7	3
Average Salary	$12,000	$12,000
Staff Budget	$84,000	$36,000

The example used above has pertained to only one course, an introductory course, provided by a Department of Government for the general studies program. The specialized courses offered by the department as part of a baccalaureate program constitute still another set of courses and part of another instructional program. The enrollment in these courses is likely to be fairly small, made up largely of students who are majors in government in pursuing their bachelor's degree. Let us assume that the department offers the equivalent of seven three-quarter courses (certain courses may be for one quarter only) and that the total enrollment in these courses

comes to 795 student credit hours for the autumn quarter. The student enrollment turns out to be 100 for one course, 50 for another course, 30 for a third course, 25 for a fourth course, and 20 each in three other courses.

Here again there are alternatives of technology involved. The department may decide that at the specialized baccalaureate program level it will not offer any course section with more than 20 students. This decision means that the seven courses will have to be offered in 15 sections. If the faculty work load is fixed at four three-credit hour courses or sections of 20 students, the decision about instructional procedure means that four full-time equivalent staff members will be needed to produce the output of 795 student credit hours for the baccalaureate program.

As an alternative, the department might decide that each course would be offered in single sections only, regardless of size. This would mean that seven sections rather than 15 would be sufficient to accommodate the anticipated enrollment. At the same time, it might be decided that 240 student credit hours produced would be considered a full-time faculty work load. On this basis, 3 full-time equivalent staff members would be needed, one of whom would instruct only one three-credit hour course but with an enrollment of 100 students (300 student credit hours). In other instances, the enrollment would justify one course being counted as one-half an individual work load or as one-third an individual work

load. If the average salary per full-time faculty member in the baccalaureate program came to $16,000 per year (of three quarters), the two different course arrangements would entail salary expense of $64,000 versus that of $48,000.

The examples just mentioned are sufficient to make it clear that technology has much to do with instructional expense at the departmental level. The faculty salary component in departmental instruction is determined by total instructional output divided by faculty work load output, which fixes the staffing needs of a department. The staffing needs multiplied by average salary fixes the instructional salary budget of an academic department, or the instructional salary budget for a program component of an academic department.

There are, of course, two complications to this kind of program budgeting by an academic department. For one thing, as we have pointed out several times already, academic departments so often do not think in program terms. Faculty members are recruited upon the basis of their specialization within a discipline or professional field of study in the interest of "rounding out" the competencies (specialties) of a department. Too seldom is recruitment undertaken in terms of the program obligations of a department or in terms of the reasonable expectations of instructional obligations confronting a department. The course offerings of a department are seldom considered in program terms but more often are likely to be considered in terms of the special interests of individual

faculty members. Indeed, it is not unusual for the same course to be available to an upper division baccalaureate student, a master's degree student, and even a doctoral degree student. Furthermore, in a department which offers courses for general studies, for the baccalaureate program, and for the master's and doctor's degree programs, faculty members are often recruited for what they can offer at the graduate levels and with too little attention to what they can offer at the first two levels.

In spite of these complications, a program budget effort by a higher education enterprise requires an academic department to think in program terms, and to budget in program terms. This kind of thinking should encourage a greater effort at precssion in formulating program objectives and course objectives. This kind of thinking should also encourage greater care in determining the instructional procedure or technology to be employed in achieving course and program goals. And this kind of thinking should introduce greater care in determining the staffing requirements of a department.

The budgeting of departmental instructional salaries is only the beginning (although the most important part) of departmental budgeting. There are other inputs which must be added to the departmental budget. Under the heading of personal services, there are certain additional categories to be considered: faculty assistants and clerical assistants.

The cost of retirement contributions and other fringe benefits must be included. Then there are the costs of supplies and equipment and of travel to be added.

For each instructional program in which an academic department participates and in terms of expected program output, the instructional budget would appear as follows:

Personal Services

1. Faculty (number times average salary)
2. Faculty assistants, such as teaching assistants, laboratory assistants, and course assistants (number times average salary)
3. Faculty support, such as secretaries, stenographers, and typists (number times average salary)
4. Fringe benefits (for all personnel)

Other Expense

5. Supplies and equipment
6. Travel and other

Program Management

To the expense of departmental instruction, or operations management, there are also the costs of program management to be included in a program budget. As we have noted, program management usually involves the activities of a college in providing supervision and coordination of various academic

department in performing their part of an instructional program. Program management is thus the expense of a level of supervision in the organization structure of a higher education enterprise.

Program management is ordinarily a limited cost element in the total instructional budget. The cost here is that of maintaining a college office with such personnel as are needed to perform the duties of program management. The possible scope of these duties has been outlined earlier in the discussion about organizational structure.

The costs of program management would include:

Personal Services

1. Deans and Assistant Deans
2. Supporting personnel, such as secretaries and stenographers
3. Fringe benefits

Other Expense

4. Supplies and equipment
5. Travel and other

Libraries

Library service is, of course, an indispensable supportive adjunct to all instructional programs. Classroom instruction in higher education is supplemented by library reading, although in general studies programs and in some baccalaureate programs there is a tendency to assign paperback

books as reading materials rather than library holdings. The inadequacy of library seating capacity as well as student mutilation or mishandling of library books have helped to encourage this trend.

In the past twenty-five years, there has also been a tendency for some instructional programs to integrate library resources with the instructional facilities. Thus a law library as a particularly essential part of legal education has usually been incorporated physically with a law instructional building. A college of medicine will usually desire its own separate medical library. A school of architecture will usually desire its own architectural library. A separate music library is often an integral part of a music building. In these and similar instances it is argued that the library needs are so highly specialized and so different from other library needs that a separate library operation is justified.

There have been two other library practices in the past twenty-five years which should be given passing notice. One of these has been to develop library "reading rooms" for various programs and disciplines apart from a central library. Thus a business library may be provided in conjunction with a business school, and a physics reading room may be provided in conjunction with the physics laboratories. The other practice has been to develop so-called undergraduate "reading library" distinct from the research or graduate library.

It is not intended here to pass judgment upon any

particular set of library policies and practices which may be adopted by any one higher education enterprise. It is important to emphasize that the library budget is usually a consolidated or centralized budget for a higher education enterprise as a whole, regardless of the particular library arrangements which may be in existence. Often the central library is given certain operating or supervisory jurisdiction over all the library activities on a campus.

The component inputs of a library budget are these:

Personal Services

1. Professional personnel
2. Service personnel
3. Clerical personnel
4. Fringe benefits

Other Expense

5. Book purchases
6. Supplies and equipment
7. Binding and repair
8. Travel and other
9. Payments for service to other libraries

Instructional Services

In the discussion about organization above, we have mentioned a number of supportive services beside the library which may be set up and operated on an enterprise-wide basis

to assist the instructional operation. These would include an audio-visual service, broadcasting service, and computer service, amcng others. These may be grouped together under the budget heading of instructional services.

For budget purposes, it is not a simple matter to draw a sharp distinction between an instructional service and a public service. How should a museum be classified: as an instructional service or as a public service? How should an instructional materials laboratory be classified? How should an aviation service, a laboratory school, a broadcasting service, a teaching clinic, a teaching hospital be classified?

In general, there seems to be one or two tests which can be applied in resolving questions of the kind just mentioned. One test is the degree of integration or relatedness between a service and an instructional program. If a museum, for example, is primarily utilized as a supplement for instruction, then it may well be classified as an instructional service. If a museum is primarily utilized, however, as a facility of general public interest, it may well be classified as a public service. A teaching hospital or any clinic providing service to a large number of patients may well be classified as a public service even though the hospital is also essential to a program of medical instruction.

It must also be recognized that an activity of a college or university may draw its support from two or more budgets. For example, a broadcasting service may be in part

an instructional service and in part a public service. As such, a part of its operating expense may properly be carried as an instructional service and another part may properly be carried as a public service.

Instructional services exist to assist academic departments in carrying out their instructional programs. The input requirements for these instructional services include:

Personal Services

1. Professional personnel
2. Technical personnel
3. Clerical and stenographic personnel
4. Fringe benefits

Other Expense

5. Supplies and Equipment
6. Travel and other
7. Utilities services

Overhead Expenditures

The overhead expenditures which must be budgeted for the instructional activity of a higher education enterprise include: (1) student services, (2) general expense, (3) plant operation, and (4) general administration. These indirect or overhead activities are almost always organized on an enterprise basis -- that is, they are performed on a centralized basis for the enterprise as a whole.

Although these overhead activities must be budgeted by activity, it is appropriate to allocate these overhead expenditures program by program upon the basis of an appropriate formula. In many instances this allocation by programs may properly be made upon the basis of square footage of instructional space utilized if this can be determined on a reasonably accurate basis.

Student services as a part of instructional overhead include five kinds of activity: (1) admissions; (2) course registration and student record keeping; (3) operation of student financial assistance programs; (4) student relations; and (5) student placement. Such specialized student services as a student health service and a student counseling service should be considered for budget and accounting purposes as auxiliary services.

General expense involves the operation of a number of services for the benefit of a higher education enterprise, such as a central computer service, telephone service, mail service, reproduction service, publication service, automotive and transportation service, and public events service. These services are usually provided on an enterprise-wide basis, and are budgeted as separate overhead activities.

Plant operation is another service usually provided on an enterprise-wide basis. It includes custodial service, plant protection and security service, heating service, electric service, water and sewerage service, equipment repair

and maintenance, building repair and maintenance, grounds maintenance, and similar activities. In a higher education enterprise, it is important that under instructional expenditures there be included only the costs of operation of plant for instructional and general purposes. The costs of plant operation for research, public service, and auxiliary services would ordinarily be determined separately and charged as overhead expenses of these various endeavors.

General administration includes the expenditures for enterprise management, including the governing board, the president's office, the office of the vice-president for academic affairs, the office of the vice-president for finance and business affairs, the office of the vice-president for planning, and the office of the vice-president for development.

For student services, general expense, plant operation, and general administration, the input factors to be budgeted would include:

Personal Services

1. Professional
2. Supervisory
3. Technical
4. Clerical and stenographic
5. Fringe benefits

Other Expense

6. Supplies and equipment
7. Travel and other
8. Contract services

Research and Public Service

In the two activity areas of research and public service, budgeting is performed on a project basis. For each such project the input factors are:

Personal Services

1. Faculty
2. Professional
3. Technical
4. Clerical and stenographic
5. Fringe benefits

Other Expense

6. Supplies and Equipment
7. Travel and other
8. Overhead

The sum total of project expenses constitute the budgeted inputs for research and public service performed by a higher education enterprise. The number of these projects individually may be fairly sizeable, and project accounting can be burdensome. There is no way to escape this effort under current circumstances.

Auxiliary Services

Auxiliary services are budgeted on a service basis; that is, they are budgeted separately for each service. A college or university may establish as many as 15 or 20 different service groupings for budget purposes. The various kinds of auxiliary services have been enumerated several times already; these services are usually so different one from another that it is essential for each service to have its own separate budget of income and expenditure.

Budgeting for an auxiliary service entails one or two unique elements. Income for an auxiliary service is ordinarily obtained in one or two ways: (1) by a sale of products or service such as books, meals, advertising in a publication, or room occupancy; and (2) by an allocation of a general fee assessed upon all students for support of a particular service such as a health service or a recreation service. Indeed, these two sources of income may be used together in order to support a particular auxiliary service.

Income budgeting is especially important for an auxiliary service since the available income ordinarily fixes the limit of the service undertaken. Sometimes with student committees involved in the determination of the program of an auxiliary service, there may be a temptation to overestimate income in order to include various desired activities within the program. Moreover, the accumulation of a surplus may be regarded with

suspicion by students.

The expenditure side of an auxiliary service may include an item of debt service for the physical facilities which have been built through revenue bond financing. This debt service is an obligation which must be met without sacrifice of current operating needs to maintain the plan in good condition. Furthermore, the indenture agreement under which revenue bonds will have been marketed will usually provide for accumulation of a debt service reserve and perhaps of a maintenance reserve. The income of the service must be adequate to meet the expenditure obligations incurred in financing the necessary capital plant.

The expenditure budget of an auxiliary service would usually be comprised of these items:

Personal Services

1. Professional
2. Supervisory
3. Technical
4. Operating
5. Clerical and stenographic
6. Fringe benefits

Other Expense

7. Cost of goods
8. Supplies and Equipment
9. Travel and other

10. Contract services
11. Overhead
12. Debt service
13. Transfers to reserves

Student Aid

The budget for student aid is entirely made up of funds distributed to students for meeting the expense of higher education enrollment. The administrative expense in operating a student aid office has been included under instructional and general expense discussed above.

There is a special complication in student aid budgeting in handling loan funds. From a strict accounting point of view, all student loan fund transactions are transactions involving capital accounts, not current operating accounts. The loan funds acquired by a higher education enterprise are capital funds. Loans represent an asset transferred from lender to borrower, and repayments represent a return of capital and accumulation of a surplus or reserve account (interest). Most colleges and universities do not charge the operating expense of the loan transactions as a cost against interest income.

There are complications in loan fund accounting because of certain provisions of federal law involving a "forgiveness" of a portion of a loan under certain conditions. Even this transaction, however, affects capital rather than operating

accounts: a reduction in loan assets but also a corresponding reduction in loan obligations to the federal government.

The student loan budget accordingly is a capital fund budget and should be handled as such.

Other forms of student aid represent a current operating transaction based upon the commitment of budgeted income to various forms of student financial assistance: scholarship grants, grants-in-aid, and fellowship grants. For budget purposes, these grants constitute a transfer payment. The budget accordingly would appear as follows:

Transfer Payments

1. Scholarship grants
2. Grants-in-aid
3. Fellowship grants

Summary

The instructional and general budget of a higher education enterprise set up on a program basis should provide a statement of proposed expenditures for the needed output of student credit hours. In turn, these total student credit hours would be reduced to a full-time equivalent student output by dividing the credit hours by 15. When the expenditures are divided in turn by the total number of students, the budget program can be expressed in terms of expenditures per full-time equivalent student.

Program budgets can then be set forth in summary terms by total expenditures and by expenditures per full-time student. Such a summary of programmed expenditures for instruction and general purposes is attached herewith. Since this summary is uniformly based upon the assumption of 1,000 full-time equivalent students per program, the figures used represent both total expenditures and expenditures for one full-time equivalent student.

SUMMARY

Instructional and General Expenditures
For 1,000 Full-Time Equivalent Students
By Program and by Major Item of Expense

(000 Omitted)

	Lower Division	Technical	Upper Div. & Bacc.-Prof.	Master's & Grad.-Prof.	Doctoral Programs	Medical Programs
Direct						
Departmental Instruction and Research	$ 560	$ 830	$1,075	$1,970	$3,470	$4,330
Instructional Services	35	35	35	35	35	225
Libraries	60	50	100	200	450	450
Overhead						
Student Services	85	85	85	85	85	85
General Expense	60	60	60	60	60	60
Plant Operation	110	150	200	300	300	300
Administration	50	50	50	50	50	50
Total	$ 960	$1,260	$1,605	$2,700	$4,450	$5,500

PLANNING CAPITAL IMPROVEMENTS

The work of higher education cannot be performed without the requisite facilities in plant and equipment. To be sure, temporary arrangements may be made to use the facilities of high schools, of office buildings, of military structures, of former hotels and other commercial enterprises, of churches, of temporary structures. All such facilities have indeed been used by higher education enterprises in periods when enrollment demand has outrun the regular supply of buildings. All such facilities are regarded as temporary arrangements until a capital improvements program can be initiated to provide the needed permanent academic facilities and equipment.

The key word in planning capital improvements for a higher education enterprise is "need." So simple a word entails a complexity of concerns. First, need is necessarily related to purpose, program, and enrollment. Secondly, need is related to utilization of space. Thirdly, need is related to quantitative standards of space. Fourthly, need is related to qualitative standards of space. And in the fifth place, need is related to aesthetic values. All of these considerations have a determinative impact upon capital improvement planning for a higher education enterprise.

Purpose and Program

Space needs are determined in large measure by the purpose

and program of an individual higher education enterprise. An obvious illustration is the difference between an enterprise enrolling primarily commuting students and one enrolling primarily residential students. If the enterprise enrolls mostly commuting students, it will have little need for residence hall facilities. If the enterprise enrolls mostly students who live on or adjacent to the campus, then the enterprise will have to provide residence halls for its students or depend upon the surrounding community to provide such facilities.

If a higher education enterprise offers an engineering program, it will have to have engineering laboratories. If a higher education enterprise offers a medical program, it will have to have facilities for the biological sciences and for clinical study and practice. If a higher education enterprise offers graduate education, it will have to have specialized research laboratories and a research library. This kind of interrelationship of program and plan could be continued until every instructional program has been enumerated.

To begin with, a higher education enterprise must consider the need for facilities in relation to the fourfold classification of major activities:

1. Instruction
2. Research
3. Public Service
4. Auxiliary Services

Student aid is an activity which is not a large consumer of space. This need can be included within the space planning for instruction.

In this discussion we shall concentrate our attention upon instructional needs. But the other needs cannot be ignored and must be mentioned in passing. In a higher education enterprise, some measure of balance is usually sought between the needs for and provision of space in conjunction with the various activities undertaken.

Auxiliary service space is not just a matter of residence halls and dining rooms (and kitchens) for students. What space shall be provided for a student health service, for student government, for student recreation, for student social life, for cultural activities, for intercollegiate athletics? All of these questions must be answered in terms of purpose of the enterprise and in terms of available resources with which to provide the desired plant.

Public service space needs depend upon the kinds of public service programs which a higher education enterprise offers. If clinical services are offered in conjunction with instructional programs, then clinical facilities are needed. If public broadcasting is to be offered, then broadcasting facilities are needed. If continuing education is to be offered in various professional fields, then there is the question whether or not special conference and seminar rooms are to be used for

this purpose. Moreover, shall participants in continuing education programs be provided special living accommodations or shall they be expected to make use of other available campus or community facilities? These kinds of questions have to be answered in determining public service space needs.

Research space need is especially difficult to determine. Because the federal government since 1941 has been particularly active in supporting university research, there is a tendency to believe that such support should include facilities as well as current operations. On the other hand, research is important in relation to such instructional programs as those for a doctor of philosophy degree and a doctor of medicine degree. These programs of instruction must also include research space; how much and how extensive in scope are not simple questions to answer.

When we turn to instructional space needs, as we have already indicated, the first step is to relate these needs to different instructional programs. Each instructional program -- technical education in certain engineering technologies, baccalaureate professional programs in art or education or home economics or nursing, master's degree programs in the social studies, a graduate professional program in law, a doctoral degree program in chemistry -- each instructional program has its own special requirements in facilities and equipment. These requirements are usually formulated by faculty members of an instructional program, or by special consultants, or both.

Program requirements may be grouped into certain general types of space needs, as follows:

1. Classrooms
    a. Lecture rooms (60 to 300 student stations)
    b. Classrooms (30 to 60 student stations)
    c. Seminar rooms (10 to 20 student stations)
2. Teaching laboratories
    a. General science or technical education (30 to 60 student stations)
    b. Specialized (15 to 30 student stations)
3. Faculty offices
    a. Department chairman and office personnel
    b. Faculty
    c. Teaching assistants
4. Specialized facilities
    a. Faculty research
    b. Museum or gallery
    c. Library reading room
    d. Other

In addition to the instructional space needs of departments, there are the supplementary space requirements. These include:

1. Instructional services
    a. Audio-visual service
    b. Evaluation service
    c. Other service

2. Library
3. Plant operation
    a. Heating and ventilating
    b. Other utilities
    c. Maintenance shops
    d. Grounds equipment sheds
4. Administration and general
    a. Admissions, registration
    b. Other student services
    c. Financial
    d. Procurement and distribution of supplies
    e. Computer and general services
    f. Administration

A higher education enterprise as an enterprise necessarily must plan its space requirements on a comprehensive basis, on an enterprise basis. The facilities for departmental instruction cannot function by themselves; they must be supported by the other services and the other facilities which make up an ongoing endeavor.

Enrollment

Instructional programs and instructional facilities are planned in terms of enrollment, in terms of credit hours of instruction to be provided. No set of space requirements is of any utility for planning purposes in the absence of an

estimate of enrollment load. Instructional programs are for instruction of students, and the adequacy or inadequacy of space needs can only be determined in the light of enrollment projections.

To be sure, once any particular instructional program is fixed as a part of the purpose and plan of a higher education enterprise, then certain minimum facility requirements must follow as needed in order to offer that program. Hopefully these minimum requirements in space will be matched by a minimum desirable enrollment of students. If this is not the case, then the planning of the enterprise has been faulty.

Indeed, a minimum desirable number of students to achieve appropriate utilization of space is a necessary part of instructional planning by a higher education enterprise. This minimum number will vary from program to program and from enterprise to enterprise. Certain guidelines for this planning can be set forth on a program and an enterprise basis. For example, it may be suggested that the following guidelines represent the "critical mass" for enterprise planning:

	Number of Students
Two-year general studies	1,000
Two-year technical education	600
Baccalaureate in arts and sciences and professional fields	5,000
University with graduate and graduate professional fields	7,500

For programs within these types of higher education enterprises, the minimum number of student enrollments will vary from instance to instance. Again, only certain general guidelines can be set forth. It is suggested, however, that the following guidelines are not unreasonable:

Program	Number of Students
General studies	250
Technical education	30
Baccalaureate major (upper division)	50
Master's degree	30
Doctoral degree	10
Graduate professional	50

There is an important distinction in space planning to be made between daytime and evening students. The total enrollment in an enterprise may consist of both kinds of students, depending upon the purpose and upon the location of the enterprise. Evening students tend to be part-time students, while daytime students tend to be full-time students. Evening students -- those enrolling for classes offered after 4:00 p.m. -- are usually commuting students.

The space requirements for a higher education enterprise are properly calculated upon the basis of the daytime enrollment. It is presumed that the evening students can be accommodated insofar as space needs are concerned by additional utilization of the plant provided for the daytime enrollment.

There is considerable difference in planning the space requirements for a new higher education enterprise from planning the space requirements to augment the facilities of an existing enterprise. In the first instance, the planning must begin in terms of a minimum comprehensive program of offerings. In the second instance, the planning must seek to improve or expand the existing available facilities. In this planning an inventory of existing facilities in both quantitative and qualitative terms is the starting point for the necessary planning.

Utilization

A major consideration in all space planning is the utilization factor for all existing and projected space. Obviously intensive use of space can reduce the need for more extensive facilities, while a low rate of space use can increase the need for facilities. In determining space requirements, an implicit or explicit utilization factor is always involved.

Space utilization of instructional plant is a complicated subject. It cannot be considered in detail here. The most that can be done is to outline the basic concerns which affect any space planning. These concerns are essentially those of class scheduling and of class size.

Insofar as class scheduling is concerned, the first complication arises from the decision whether or not to schedule

classes on Saturday. It is suggested here that daytime students should not be scheduled for Saturday classes. For scheduling purposes, Saturday morning must be considered as an alternative to evening class offerings, as an appropriate time for instruction of part-time students.

If we consider five days a week as the appropriate scheduling basis for daytime instruction, then a decision must be made about the hours for such scheduling. It is suggested that a 40 hour week is the appropriate basis, from 8 a.m. to 3:50 p.m., five days a week. Such a schedule provides 40 class periods of 50 minutes each in a five-day week.

A 40 hour class schedule week immediately encounters the complication of how to accommodate classes and laboratory periods of various time requirements. A three credit hour course meeting three periods a week of 50 minutes each will readily fit a Monday-Wednesday-Friday schedule but will not fit a Tuesday-Thursday schedule. The obvious accommodation for a three credit hour course is to meet for a period of 100 minutes on Tuesday and for a period of 50 minutes on Thursday. This kind of scheduling seems especially appropriate for large lecture sections, accompanied by a discussion section.

To be sure, another alternative is to offer only five credit hour courses which meet five times a week instead of three times. This kind of scheduling is feasible in a very carefully constructed curriculum laid out for an entire instructional program. It probably requires a reduction in student

choice among available course offerings.

Still another complication arises in the scheduling of laboratory periods. Such periods are usually expected to run 110 minutes, or the equivalent of two classroom periods on any one day. Such two period combinations can be scheduled without too much difficulty, but such scheduling eliminates the opportunity for a student to have a class period which would conflict with a laboratory period.

Classroom and laboratory scheduling has to be handled on a centralized basis making use of the entire pool of facilities in the inventory of a higher education enterprise. With the assistance today of high speed computers, such scheduling can be arranged rapidly and accurately. But the element of free choice for faculty members and students may have to be restricted in such scheduling.

The appropriate standards of classroom and laboratory utilization in a higher education enterprise must be fixed with an awareness of the complications which necessarily attend the scheduling of these facilities. An appropriate standard of room utilization is as follows:

	Hours per Week
Classrooms	
Lecture halls	24
Classrooms	30
Seminar	20
Teaching Laboratories	
General	20
Specialized	--

It is difficult to envisage any scheduling operation for a 40 hour week which could bring about a more intensive utilization of space than these standards without adoption of a limited number of course choices in a curriculum and a limited number of curricular offerings.

The standards just presented are standards of classroom and laboratory utilization. This is only one standard of utilization. Each classroom and each teaching laboratory are also comprised of a given number of student stations: seats, desks, or laboratory space accommodating one student. Student station utilization depends upon the number of students enrolled in each class and laboratory.

Matching class size with classroom accommodations in the enterprise inventory and matching laboratory class size with laboratory accommodations in the inventory are further challenges to scheduling. The particular mix of lecture halls, classrooms, and seminars which exist at any one time may or may not fit the particular instructional technology which exists at that time. A 60 per cent student station utilization on an over-all enterprise basis is certainly a reasonable standard to set as an objective. The obstacles in the way of realizing such an objective will be sizeable.

Qualitative Standards

Space has both quantitative and qualitative dimensions. If these qualitative dimensions tend to be somewhat inexact,

they are nonetheless important. Quality expresses at least two considerations. One is the matter of facilities which contribute maximum effectiveness to the program which space accommodates. The other is the matter of maintenance cost, the amount required to keep facilities in good working order.

The qualitative factor in facilities is often thought of in terms of obsolescence. This is a major consideration. The plant available to a higher education enterprise may have been built a number of years ago. There is a rule of thumb in higher education planning which says that an instructional building needs a general overhaul at the end of 30 years of use and needs extensive rehabilitation at the end of 60 years of use. These are reasonable guidelines to repair and rehabilitation planning.

The basic question after 60 years of use of a building is whether or not the structure shall be rehabilitated or torn down and rebuilt. Here again, a rule of thumb may serve as a useful guideline. If the cost of rehabilitation is 50 per cent or more of the estimated cost of new construction, then rehabilitation is a questionable investment.

Maintenance is the key to continued usefulness of existing structures. Poor or careless maintenance is consumption of capital, and means that the general overhaul or rehabilitation of a structure will be much more costly than would otherwise be the case. While there is always a temptation

to reduce current operating expenses for maintenance, this practice is seldom an actual economy.

Regardless of maintenance standards, a facility may nonetheless become obsolete for instructional or other use by a higher education enterprise. If the realm of knowledge of an instructional program has greatly changed over a period of years, as in the physical and biological sciences, then an instructional facility for the program, even if under 60 years of age, may be obsolete. The kind of equipment needed for an instructional program may change over a period of years to the point where an entirely new facility becomes essential.

Quantitative Standards

In determining space needs, it is customary to establish certain quantitative standards for room requirements. Obviously, such requirements vary among programs offered by a higher education enterprise. Requirements may also vary with the extent of the space "luxury" which may be desired by a college or university, and which can be afforded in terms of available financing.

Standards of space are of two kinds: standards for individual room sizes and standards for the total facilities in terms of enrollment. Both sets of standards are useful in planning space requirements. The one set suggests the desirable

size of a particular kind of room, and the other set of standards suggests the limits in total requirements.

Standards for room size may be set up as follows:

	Sq. Ft.
General Classroom	15 per student station
Lecture Hall	12 per student station
Seminar Room	20 per student station
Library reading rooms	25 per student for 30 percent of daytime enrollment
Library stack areas	100 per 1,000 books shelved
Teaching laboratories, including preparation and storage space	60 per student station
Faculty office	120 per faculty member
Departmental office	160 per chairman
Reception and secretarial	150 per office

Such standards as those just cited provide the planner with desired sizes for various kinds of facilities to be included in a particular instructional structure. The "mix" of such facilities adds up to a building and indeed to a campus, insofar as instructional needs are concerned. The desirable mix is not easy to determine. There is a tendency to include too many classrooms and not enough space for students to use in their between class periods of time, especially on a commuting type campus.

The net assignable space in an instructional building is that space devoted to classrooms, laboratories, faculty offices, library activities, administrative areas, and student areas. The gross space in an instructional building is the total square footage of the structure, including walls, corridors, stairways, rest rooms, utility rooms, and custodial

space. The desirable relationship between net assignable space and gross space is a ratio of 1 to 1.6, at least as an average for all instructional facilities. Thus if the net assignable space in a building is 50,000 sq. ft., the gross square footage should be in the magnitude of 80,000 sq. ft. If the net assignable space in a building is 100,000 sq. ft., the gross square footage should be in the magnitude of 160,000 sq. ft. A good deal of effort is required to make certain that the proportion of net assignable space to total space is not less than 60 per cent.

There is some evidence in recent building and campus planning that for most instructional and general needs, the minimum space requirements are around 75,000 gross sq. ft. per 1,000 daytime students. Some 100,000 gross sq. ft. per 1,000 daytime students would represent a fairly adequate amount of space, while 150,000 gross sq. ft. per 1,000 daytime students should provide an enterprise with fairly good space for graduate study and research. Thus a university of 10,000 daytime students would need around 1,500,000 gross sq. ft. of space for instructional and general purposes, not including highly specialized space for research, for a teaching hospital, for public service, and similar endeavors. This space figure, of course, does not include any allowance for residence halls, dining halls, or recreational and other student facilities.

Aesthetics

The quality of a college or university building program is a matter of more than materials; it is above all else a matter of style. Unfortunately, there is no agreement about what constitutes "good" style for a higher education enterprise. Some colleges and universities have been built in the gothic style, some in the so-called "colonial" or traditional style, some in the "contemporary" style. Even these labels do not convey a sense of the wide range of appearances which may be included under these various designations.

There is a great deal of argument about unity of style. Some persons believe that once a campus has started to build structures of a particular style, future structures must be patterned after the same style in order to preserve a harmony or unity of appearance. Others argue that variety and diversity in architectural style is useful in displaying the different kinds of appearances which can be given to a campus. Still others assert that with proper spacing and with use of the same kinds of materials (brick, stone, concrete, etc.) varied styles may still present a satisfying sense of coherence.

It is apparent that style is in large part a matter of subjective judgment, of the sense of beauty which the beholder brings to any particular structure. If beauty is a matter of common form and mass, of similar appearance, of harmonious color and texture, then one kind of style will be pleasing and another kind of style displeasing. If beauty is a matter of

variety, of contrasts, of dissimilarities, then the sense of satisfaction experienced by the beholder will depend upon the presence of these characteristics.

Unquestionably a concern for aesthetics is important in a campus. But there are no standards to guide the planner in giving expression to this concern.

Summary

There are many factors involved in capital facilities planning for a higher education enterprise. These factors may be summarized as follows:

1. Instructional Facilities
2. Support Facilities
   a. Instructional Services
   b. Library Services
3. Overhead Facilities
   a. Student Service Facilities
   b. Plant Operation Facilities
   c. General and Administrative Facilities
4. Other Facilities
   a. Research
   b. Public Service
   c. Auxiliary Services

For all such facilities there are considerations of enrollment, space utilization, space standards, quality and

aesthetics to be reconciled in planning the desired capital plant of a higher education enterprise.

SPACE STANDARDS

University Branch

1000 Full-Time Equivalent Daytime Students

	Unit Sq. Ft.	Total Sq. Ft.	
Classrooms			
3 rooms, 24 stations	400	1200	
6 rooms, 30 stations	480	2880	
5 rooms, 40 stations	600	3000	
2 rooms, 60 stations	900	1800	
1 room, 80 stations	1120	1120	10,000
Lecture Room			
1 room, 300 capacity			3,600
Laboratories (Including Preparation and Storage			
2 Biological Science	1100	2200	
2 Chemistry	1300	2600	
1 Physics	1200	1200	
1 Art	1250	1250	
1 Music	1250	1250	
1 Language	1000	1000	9,500
Library and Study			10,000
Student Services			
Lounge and Food Service		6000	
Bookstore		1000	
Clinic		300	
Offices and Work Rooms		1000	8,300
Faculty Services			
45 Offices	100	4500	
Lounge		500	
Service Area		1000	6,000
Administration			
Offices		2000	
Receiving and Storage		1000	3,000
Net Assignable Space			50,400
Non-assignable Space			26,600
Gross Space			77,000

SPACE STANDARDS

Technical Institute

600 Full-Time Equivalent Daytime Students

	Unit Sq. Ft.	Total Sq. Ft.	
Classrooms			
2 rooms, 24 stations	400	800	
3 rooms, 30 stations	480	1440	
3 rooms, 40 stations	600	1800	
1 room, 50 stations	750	750	
1 room, 80 stations	1120	1120	5,910
Laboratories (Including Preparation and Storage)			
5 Science Laboratories		6000	
2 Drafting Rooms		3000	
2 Business Laboratories		3000	
4 Engineering Laboratories		10000	
2 Medical-Dental Laboratories		2000	24,000
Library and Study			6,000
Student Services			
Lounge and Food Service		3000	
Bookstore		800	
Clinic		300	
Offices and Workrooms		500	4,600
Faculty Services			
12 Faculty Offices (Double)	150	1800	
10 Faculty Offices	100	1000	
Lounge		500	
Service Area		800	4,100
Administration			
Offices		1800	
Receiving and Storage		1000	2,800
Net Assignable Space			47,410
Non-assignable Space			22,590
Gross Space			70,000

PROGRAMMING CAPITAL IMPROVEMENTS

The capital improvements planning of a higher education enterprise eventually finds expression in five basic elements or documents. These are:

1. Long-range Space Projections
2. Campus Master Plan
3. Six-year Improvement Plan
4. Two-year Program
5. Building Plan

Long-range Space Projections

The first important document in programming space requirements for a higher education enterprise is to prepare a long-range projection of space needs. Such a long-range projection may well be made for 15 or 20 years ahead, and would necessarily be based upon program projections, enrollment projections by programs, and space standards. To these needs would have to be added the requirements for replacement of obsolete facilities.

Long-range space projections are apt to be on the generous side, and such projections often fail to consider the various possibilities which may influence the course of events, such as changing patterns in higher education enrollments and the development of new higher education enterprises. Nonetheless, these projections are essential as a starting point in

developing some sense of goals to be realized in the capital improvement program of a higher education enterprise.

Campus Master Plan

The key element in every higher education capital improvement effort is a campus master plan. This campus plan sets forth a design of the area comprising a campus. The very word campus in its Latin origin means field, and implies the existence of a definite geographical area within whose boundaries it is intended to build a set of facilities comprising a particular higher education enterprise. The concept of campus provides definition for the lay-out of the long-term objectives in capital improvements.

To be sure, the concept of campus boundaries which exists at one time may have to be extended at a later date. Or a campus master plan may embrace an area beyond that actually owned by a higher education enterprise. In either case, land procurement becomes an important element, and a precondition for actual fulfillment of the campus plan.

A campus master plan accomplishes two basic requirements. First of all, it sets forth in design or location terms the enrollment and program goals of the higher education enterprise. The campus plan is expected to provide facilities for the students who will enroll in the college or university, and the campus plan is expected to provide facilities for the

instructional and other programs which are to be pursued by the college or university. Secondly, the campus plan sets forth a scheme of spatial relationships, the location of various facilities in relation one to another.

There are two common features in most campus master plans. One is a zone arrangement in which like activities tend to be grouped together. The other is a traffic pattern by which ingress and egress are handled for the campus, and by which the necessary internal movement of persons and things is expedited. Both features need not be the same in every campus master plan, but each aspect is necessarily given careful attention in the design of a campus master plan.

Under the zone arrangement related facilities are grouped together. Thus, for example, a specific part of the campus is considered to be the instructional area or zone in which classroom buildings and library are brought together in relationship to each other. Another zone may be set aside for student residence facilities, a third zone for research facilities, a fourth for public service, another for recreation and athletics, etc. The zone arrangement or grouping of related activities is intended to bring persons together as they engage in the same or similar effort, to avoid a mixture and congestion of activities, and to facilitate movement.

In some instances, the zone arrangement may be employed to integrate some activities when the purpose and plan of a higher education enterprise calls for such close inter-relationship. Thus, living units and instructional facilities may be

grouped together when the planning of a university calls for so-called "clusters" of students brought together in designated groupings for both instruction and residence. The idea of the cluster college is to integrate rather than to separate instruction and student social life. Indeed, the basic idea is to encourage a student social life subordinate to and supportive of the instructional program.

This is not the place either to advocate or to criticize the cluster concept. The important consideration is that if the cluster concept is the determined planning basis upon which a campus master plan is to be laid out, then obviously this concept must find expression in the physical relationship of facilities to be built on the campus.

Probably no aspect of a campus master plan is more troublesome than that of traffic flow. The automobile is a complication for urban planning and for campus planning. The prevailing arrangement in many campus master plans is to try to confine vehicular traffic, other than that of the necessary service vehicles, to the outer fringes or the circumferential areas of the campus. Usually the instructional zone will be confined to pedestrian traffic. Parking space for students and staff is provided on the edge of the campus. Such arrangements are often criticized by faculty and students on the grounds that the distance from parking area to instructional zone is too great. And unless actual barriers to vehicular movement are erected, some traffic plans will be violated rather

than observed.

Providing adequate parking space is another major difficulty. Students are very apt to arrive on a campus one per automobile. It would be helpful if there were more doubling up of passengers, or if more use were made of public transportation, but these are wishes which seldom find expression in reality. As a consequence, a campus must devote a large extent of space to parking lots, which seldom make a very pleasing impression upon one's view, or a campus must resort to parking decks and garages with multiple floors of space, which are expensive to provide. When a campus has a considerable amount of land available, parking lots are almost inevitable. When a campus has a very limited amount of land and must achieve intensive utilization of land, then parking decks become the necessary facility.

Spatial relationships on a campus are much more than simply a matter of convenience or even of traffic flow. Spatial relationships have a great deal to do with the visual impression of a campus, with the aesthetic value of a campus. Space is as much an ingredient of visual impression as is the design of any one structure or any group of structures. It is customary to seek some kind of definite pattern or harmony in spatial relationships, although it is not necessary that any one set of such relationships, such as quadrangles, needs to be adhered to without exception. But whatever the lay-out pattern, space is a critical factor in the appearance of a campus.

A campus master plan is not a static document. Rather it is a guideline to be used in making decisions about particular structures. The master plan must necessarily be revised from time to time as new factors emerge in capital planning. Enrollment projections may change; instructional programs may be altered; new ideas may be developed about the facilities needed to carry out the objectives and programs of the higher education enterprise. Periodically a revision in the campus master plan is necessary to give effect to changing needs and circumstances.

An important part of a campus master plan is provision for essential utility services. The traffic pattern and the lay-out of walks and drives are only a beginning. There are other utility needs to be met: water lines, sewer lines, electric lines, heating and ventilating lines, communication lines. Moreover, utility lines must be connected with a source of service. In some instances, certain utilities such as heating and ventilating may be provided on a "packaged basis," as an integral part of one building or a related group of buildings. Water, sewerage, and electricity frequently cannot be provided on any such basis. Tunnels make the ideal arrangement for utility services, but tunnels are expensive to build, especially if a campus covers a large area.

The need of utility services may be broadened to include maintenance services: the shops, storerooms, garages, and

other facilities needed in order to operate a campus properly. As a campus grows in size, its utility and maintenance services must grow likewise.

It is no exaggeration to say that a higher education enterprise without a campus master plan is not engaged in any careful, coherent planning of its campital improvement requirements. The campus master plan is the first item or document in a capital improvements program.

Six-year Improvement Plan

The campus master plan embodies a long-range set of capital improvement objectives for a higher education enterprise. Presumably these objectives are to be realized over a period of time; perhaps ten, twenty, or even more years. To be sure, a master plan contemplates certain general objectives in enrollment size and instructional programs. But these objectives are not expected to be achieved in the immediate future.

As a consequence, a higher education enterprise undertakes to prepare a more limited set of goals within the context of this campus master plan. This more limited set of objectives usually constitutes the six-year improvement plan. Such a six-year improvement plan sets forth the specific structures to be built or rehabilitated, the new traffic patterns to be created, the new utility services to be provided within a

specific time span. The six-year improvement plan is a gathering together of the items of highest immediate priority in achieving the long-range capital facility goals of the campus master plan.

How are these priorities to be determined? One factor is the prospect of available financing. Indeed, this is the critical factor, and must be discussed at some length. But financing is not the only factor. There are two or three other determinants of priorities which must be given careful consideration.

One of these is the matter of age of existing structures. Has deterioration or obsolescence reached a point where replacement is imperative? Under such circumstances, there is reason to give high priority to inclusion of the replacement facility. It is not unusual for a higher education enterprise to make use of a building or even of temporary structures long beyond the time of their utility, partly because of the pressure of expansion and partly because of varied space needs which arise on a campus. Replacement is thus apt to be postponed until it becomes absolutely imperative.

Another consideration in determining priorities among improvement projects is the contribution which a particular structure will make toward realization of the campus master plan. A new library facility, for example, may be postponed for a time as classroom and laboratory facilities are constructed, but such a postponement cannot be continued indefinitely. Maintenance facilities may be accommodated for a

period of time in temporary facilities, but a point may be reached at which such postponement cannot be continued without a major breakdown in maintenance operations. Thus because of enrollment and program objectives, priority may be given to certain instructional facilities. At some point in time, however, priority must be given to the support facilities without which the instructional facilities cannot be effectively utilized for their basic purpose.

The priority of a structure may also be determined in terms of campus development. It may be that one facility may have to be built before another facility can be torn down. Or land may have to be acquired before one or more buildings can be constructed. The absence of utility services and traffic services may prevent the construction of some building. In other words, there may be an orderly sequence in which structures must be built if all these facilities are to be functional or operative.

Whatever criteria may be employed in establishing the priorities of capital improvements in a six-year plan, the element of judgment about the relative urgency of individual projects cannot be avoided. This element of judgment will necessarily influence the final decisions about priorities. There is no simple way to avoid such determinations.

As has already been mentioned here, the critical factor in any six-year improvement plan is the matter of prospective financing. There are two ways in which to approach the formulation of an improvement plan. One is to disregard the

whole issue of financing. It may be argued that a six-year plan should represent the various urgent projects for campus development, and that these needs should be set forth regardless of the immediate prospects for financing. The second way in which to approach an improvement plan is to include projects which represent the most urgent needs and for which there is some reasonable prospect of financing. "Reasonable prospect" may be determined upon the basis of past experience, upon the basis of preparations for a fund-raising campaign, and upon the basis of a financing plan involving borrowing of capital improvement funds.

It seems obvious that some kind of adjustment between "absolute need" and "reasonable prospect of financing" is called for in preparing a six-year improvement plan. Need must be calculated in terms of enrollment and program objectives. If this need cannot be financed, then enrollment and program objectives should be cut back. Need is an important concept in formulating financing arrangements.

On the other hand, a six-year improvement plan which looks to the accomplishment of every conceivable capital improvement ambition of the next decade is scarcely a plan; it is a dream. In some way there must be an interaction between need as an absolute and financing as a practical limitation upon what can be accomplished in a given time span.

It must be remembered that a six-year improvement plan

is actually the formulation of capital improvement goals for a decade. The lead time in capital improvement undertakings is often misunderstood by faculty members, students, alumni, and others. A six-year improvement plan may well encompass ten years between formulation and completion. There are at least four major steps in the accomplishment of any six-year plan: (1) consideration and financing of the projects; (2) preparation of drawings and specifications; (3) awarding of construction contracts; and (4) construction. There is no standard timetable for these activities, but for any one project the time span may well be five years: one year in financing, two years in planning and awarding contracts, and two years in construction. Thus in a six-year improvement plan, projects low on the priority list might be at least ten years away from completion.

A six-year improvement plan needs to be revised every two years. As projects are financed and active preparation of drawings and specifications begin, these projects can be dropped from the plan and new projects added. If there are delays in obtaining the financing and in preparing drawings, then the six-year plan remains in force until certain projects actually move into the construction stage.

The Two-Year Program

The projects of highest priority within the six-year

improvement plan can be grouped together to make up the two-year program. This program is important for two reasons. In state government where capital improvement appropriations are made for a biennium at a time, this two-year program fits the appropriation sequence. In addition, the two-year program comprises the projects on which major financing and architectural effort can be concentrated. The two-year program is the immediate goal of current operating activity concerned with capital improvements.

The two-year program, of course, can be determined by the simple matter of dividing a six-year improvement plan into three equal parts. This method of programming has the advantage of being easily presented and easily understood. It gives the impression of neatness, and presumably of an arithmetic progression in capital facilities expansion.

The difficulty with the equal thirds method of arriving at a two-year program is readily apparent. It presumes that all projects can be completed on a fairly equal timetable and that the order of priority is one of convenience rather than of program need. Moreover, there is the complication whether or not equal thirds is determined simply as a matter of dividing total estimated cost of a six-year.

There is much to be said for undertaking a capital improvement program upon a schedule which is fairly consistent in dollar volume. This procedure in general provides a uniform work load for the administrative staff and the construction industry. This

procedure may avoid sudden shifts in work load which may overtax resources and may even contribute to price inflation on the part of contractors.

On the other hand, an even work load may not reflect the urgency of current needs, the differences in the relative magnitude of various projects, and the requirements for facilities in relation to one another. These considerations may dictate the desirability of having more projects in one two-year program rather than another. There is no ironclad law which demands that a six-year improvement plan shall be divided into equal thirds, in terms of number of projects or of cost estimates.

In any event, the two-year program is the statement of immediate needs for capital improvements on a campus. The program sets forth the scope of current activity to resolve the issue of financing and to begin the work of detailed preparation of architectural drawings and specifications. The two-year program is the set of capital improvement projects demanding immediate attention.

Once again, the matter of financing is critical in a two-year program. One problem is to determine how far to go in the preparation of preliminary drawings or sketches of a desired structure. It is probably easier to make an impression upon legislators and others if a project is represented as a structure rather than simply as a set of space needs. Indeed, federal government agencies making facility grants usually

expect at a minimum a set of preliminary floor plans as a part of a financing application. If the floor plans are accompanied by a rendering indicating the general appearance of the proposed structure, this addition may well advance favorable consideration of the proposal. Often an outline of specifications will also be expected in order to indicate the kinds of materials which will be incorporated in the proposed structure.

There is a considerable danger, however, in pushing ahead with architectural drawings before the financing of a project is assured. There is the risk of having made expenditures for drawings which cannot in the near future be used for actual construction of the facility. The result is a capital investment for which there is no immediate return. Beyond this consideration, however, is the common experience that when financing of a project is delayed two or even four years, the drawings will no longer be considered adequate. The using departments or services will have changed their ideas about an adequate facility for their use and will want their new ideas reflected in the floor plans of the structure. The result is that the earlier set of drawings will now be obsolete and so the entire investment in them is lost.

It seems that the most appropriate procedure is to undertake certain minimum preliminary sketches of floor plans and of structures during the period when the financing arrangements for a capital improvement project are under consideration.

It makes little difference whether or not the consideration is by administrative agencies, legislative committees, foundation officials, or lending agencies.

When financial arrangements for a new capital improvement facility have been completed, a revised statement of space requirements is needed. This revision should take into account any program changes since a building was initially outlined, as well as any changes in construction costs which may have occurred since preliminary estimates were prepared. A revised set of space requirements is the only way to ensure that a useful and usable structure will result from available financing.

Upon the basis of revised space requirements, an architect can begin to prepare detailed drawings and specifications for the desired structure. It is unfair to ask an architect to prepare detailed drawings unless final decisions about financing, space requirements, and design have been made.

The Building Plan

Thus the final phase of capital improvement budgeting has been reached: the preparation of construction plans and specifications. Yet this is no simple procedure. There are still many details to be determined, not just by the architect and engineers, but by the higher education enterprise itself. The question whether or not the facility will be a satisfactory

addition to the capital plant of the enterprise is determined by the care and effort which goes into preparation of the building plan.

The architectural work in connection with a building plan usually consists of three different phases: the preliminary drawings, the basic drawings, and the working drawings and specifications. There may also be shop drawings prepared by the architect or the contractors setting forth the final details of the materials incorporated into the structure during the process of construction.

The beginning for the preparation of preliminary drawings is the statement of rooms by space size to be provided by the building. A first version of such preliminary drawings may have already been prepared in conjunction with the financing arrangements, as mentioned above. The preliminary drawings go beyond these early efforts, however, because preliminary drawings are the basis for final decisions about space functions, space allocation, and space relationships within the proposed structure. These preliminary drawings may be altered several times in order to obtain the most satisfactory space plan for a building.

It is customary for the users of space -- academic departments and others -- to want more space than can be provided by available financing. Space demands without a carefully prepared schedule of space use are difficult to defend or justify,

and may well be rejected in whole or in part during the preliminary drawing stage.

The design and general appearance of a building must also be determined finally during the preliminary drawing stage. Space is necessarily contained within a shape, and shape is a three dimensional cube which must have definite measurements of width, length, and height. Shape is a physical constraint in building design and must be recognized as such. Design, of course, is more than shape. It is also appearance, and here decisions about style and aesthetic impression must be finally resolved.

There is yet another matter to be settled during the preliminary design stage. This is the question of cost estimates. Apart from the problem of rising costs of building construction which have been particularly evident in recent years, there is the practical matter that building financing is more than the cost of construction. The elements of cost in a building design include:

1. Site development, including landscaping, walks and drives, and parking
2. Utility connections to the structure
3. Planning and architectural costs
4. Construction costs
5. Equipment costs

All of these costs are necessary to a completed building project, and all these costs must be met from the available

financing. As a consequence, estimated construction costs must be kept within a total budget which makes due allowance for all these costs. Obviously all the available financing cannot be used solely for the building proper. If this were done, the result would be an incomplete, and unusable, structure.

Once preliminary drawings have been finished, the basic drawings of the architect advance the building plan still an additional step toward completion. Basic drawings provide greater detail and refinement of the preliminary drawings insofar as floor plans and design are concerned. Various utility services -- water, heat and ventilation, electricity, sewage and drainage, waste disposal, elevator -- must be included and building services must be adequate (such as stairways, corridors, toilet rooms, custodial closets and rooms).

Some modifications in preliminary plans may still have to be made during the basic drawings stage. Details of utility and service space may require changes in basic space allocations and adjustments may be necessary. Basic drawings also provide an additional occasion for reviewing building design and appearance.

Uncertainties of construction cost may be handled by means of additive or deductive alternates. An entire wing of a building may be an alternate, to be eliminated if construction bids are too high to be met within a financing

arrangement. Sometimes a floor may be left unfinished, without installation of floor covering, interior wall partitions, heating and ventilating equipment, lighting fixtures, and plumbing equipment. Sometimes a wing of a building may be constructed with two floors and another two floors for later addition. Obviously all these arrangements are resorted to in the expectation that additional funding of the structure can be obtained in the future.

With final approval of the basic drawings, the preparation of working drawings and specifications is a matter of hours and hours of work by an architectural office. The care and precision with which working drawings and specifications are prepared are important for two reasons. These drawings and specifications constitute the base upon which competitive bids are made by construction contractors. In addition, the more precise the working drawings, the less expense will occur in necessary change orders during the construction process itself.

The working drawing stage is followed by the bidding stage, the award of contracts to the lowest and best bidder, and the start of actual construction. The planning and budgeting process is now finished and the realization of the desired capital improvement is a matter of construction timing and work quality.

Summary

The capital improvement program of a higher education enterprise entails both physical and fiscal effort. In this chapter primary attention has been given to the physical aspects of capital improvements rather than to the fiscal aspects. This emphasis has not been intended to suggest that the fiscal aspect is unimportant. On the contrary, fiscal arrangements for capital improvements are a pre-condition for every capital improvement project.

It is important, however, to understand that the care with which the physical aspects of capital improvement planning and programming are undertaken can and does make a great deal of difference in the financial planning. Arrangements for financing capital improvement objectives are much easier to accomplish when the physical planning has been carefully undertaken in terms of program and enrollment objectives, space utilization standards, and space standards. Arrangements for financing capital improvement objectives are also easier to accomplish when capital plan objectives are translated into improvement programs of campus lay-out, six-year improvement plans, and a two-year construction program.

Only when capital improvement planning and programming have been undertaken with care and precision can financial arrangements be pursued with some hope of success. When such financing is not obtainable, then the instructional and other

objectives and the enrollment objectives of a higher education enterprise will have to be adjusted to fit available plant capacity. There is no other choice.

IMPLEMENTING THE SYSTEM

Planning, programming, and budgeting as a system of management within higher education enterprises must itself have an output: plans, programs and budgets. The utility of the system is evident only in the quality and the detail of the results produced by this management effort.

Essentially, a planning, programming, budgeting system in a higher education enterprise must provide certain specific end results. These are embodied in documents which are available to all appropriate officials in the enterprise.

The Educational Plan

The first essential document is the educational plan. This document must be issued at the enterprise level of management, but obviously the inputs must be provided from the operations and the program levels.

There are at least three major parts to any educational plan:

1. The Purposes of the Enterprise
2. The Programs of the Enterprise
3. The Enrollment of the Enterprise

Each component part of the educational plan entails a careful resolution of the many issues concerning purpose and objectives, concerning programs, and concerning enrollment. And all are necessarily closely interrelated. In addition,

purposes, programs, and enrollment must be considered in the context of available resources.

The issues of purpose for a higher education enterprise have been outlined above. Here it is necessary only to review these in summary form in order to emphasize the range of concerns to be resolved. In terms of instructional objectives, an enterprise may wish to achieve both the development of individual intellectual abilities and the provision of professional talent needed by society. If both purposes are to be undertaken, then there are issues of relative emphasis and of integration between these purposes. Furthermore, the purposes must necessarily be given some concrete definition in terms of characteristics of individual development and of professional education.

Moreover, the instructional, research, and public service elements of an educational plan need careful structuring. For a number of years, research and public service purposes and programs have been considered by some persons as separate from and hostile to instructional purposes and programs. In some instances, certain higher educational enterprises have even endeavored to establish some formula of appropriate relationship between these activities (one such formula is a 5:2:1 ratio of effort). In both the academic disciplines and in professional fields of study, one hears that research rather than instruction is emphasized, or that public service interferes with instruction.

The programs of instruction, research, and public service to be undertaken by a higher education enterprise give meaning to its general and long-range objectives. These programs set forth the actual effort to be devoted to purposes, the specific outputs desired, and the technology of the endeavor. Purposes remain vague and illusory until translated into programs.

Programs are closely related to enrollment considerations, from admission standards to course loads to placement activity. Admission standards can be fixed in such a way as to limit enrollment. Or admission standards can be fixed in such a way as to enroll students who may not be able to meet performance standards. Enrollment may exceeed available resources in faculty and facilities, or enrollment may be wasteful in its under-utilization of faculty and facilities. When students complete a program of instruction, presumably there will be placement opportunities for the graduates.

Performance standards for instructional programs present a particularly difficult problem because of racial and other implications. It is likely that many black students have not had the same educational opportunity in our society as many white students. Presumably, where the disadvantage of the black student relates to educational opportunity, some effort might be made by compensatory or developmental instructional effort to assist disadvantaged students in realizing their potential for academic achievement.

Different instructional programs may have different levels of expected performance standards. These differentials are apt to create complexities in the operation of a higher education enterprise. It is commonly said that the highest standards of individual performance are demanded in medical education, and then in graduate education at the doctoral degree level. Different levels of intellectual and skilled performance may exist among many different instructional programs. There is nothing inherently wrong in this circumstance, although academic purists frequently criticize the faculty and students in some programs as being academically inferior.

Moreover, various instructional programs may require quite different intellectual and skilled characteristics among faculty and students. Within the broad domain of the arts and sciences, quite different characteristics are evident among students of the physical sciences and mathematics from students of the social sciences and humanities. Quite different performance standards are expected in engineering from law, in architecture from social work, in agricultural economics from home economics, in music from art.

Nor should affective standards of performance be ignored in an educational plan, although plans generally tend to avoid this subject or to treat it in the vaguest of generalities. Attitudes about learning, about individuals, and about society not only affect the program objectives of the educational plan;

they are a part of the educational plan. As such, they deserve acknowledgment, discussion, and if possible, formulation as desirable behavioral outcomes of the educational process. At the very minimum, there are mutual obligations in the learning process: (1) to instruct and to learn, (2) to explore and to accept new knowledge, and (3) to perform service and to be competent and committed to serve.

The programs of an educational plan encompass more than instruction, research, and public service; more than intellectual, skilled, and affective standards of desired performance. We have already referred to enrollment issues, and we shall mention these further below. An educational plan involves student affairs programs, a student aid program, auxiliary service programs, and general support (or enterprise maintenance) programs. An educational plan is not complete without these additional and supportive parts.

Enrollment objectives for a higher education enterprise are critical in several ways. Instructional programs are closely related to enrollment goals; there is no purpose in offering instructional programs for which there is no enrollment demand. There is likely to be little purpose in offering instructional programs for which there is no employment demand when graduates are ready to accept paraprofessional or professional placement. There is little purpose in accepting enrollment when the number of students exceed the instructional capacity of the faculty, the facilities, or the

educational environment. There is little purpose in accepting enrollment in instructional programs where there is overcrowding and in ignoring enrollment deficiencies in instructional programs where there is an excess capacity of faculty and facilities.

Beyond these obvious factors in the enrollment objectives of an educational plan, there are other factors to be considered: the demand for additionally educated para-professional and professional personnel to be anticipated over the next five or ten years; the number of young people and others seeking educational opportunity over the next five or ten years; the proportion of both professional supply and enrollment demand which a particular enterprise should set as its goal. Moreover, enrollment may depend in large part upon whether or not students are expected to live on campus (or adjacent to it) or at home. Enrollment may be expanded by accepting students on a residential basis. The question is whether or not such acceptance reduces opportunity for commuting students; whether or not such acceptance is necessary in order to meet enrollment goals for particular instructional programs; whether or not such acceptance is necessary in order to meet the desires of students to attend college away from home.

Enrollment objectives are necessarily closely related to admission standards. Unfortunately, many persons consider admission standards in a vacuum, in the context whether or not open admissions is a desirable practice. Actually, admissions

standards must be related to performance standards which are included in instructional programs. It is highly desirable that admissions standards be reasonably related to performance standards.

Finally, programs of all kinds must be related to resources: resources currently available and resources reasonably to be anticipated over the years ahead. There is a tendency for higher education personnel to be impractical; that is, to formulate ideal sets of objectives without careful consideration of where the financial, the personnel, the facility, and other resources are going to be found with which to carry out these plans. No educational plan can lay claim to being a plan until it is carefully integrated with resources. Here is the indispensable linkage between planning and budgeting.

Obviously the educational plan of a higher education enterprise is a comprehensive document. Without such a plan, no higher education enterprise can lay claim to being a meaningful endeavor, or a well-managed one.

The Campus Master Plan

The second essential planning document for a higher education enterprise is a campus master plan. This document represents pictorily and by description the objectives in physical facilities for the campus, or geographical area, of a

higher education enterprise. Necessarily, a campus master plan is based upon the educational plan.

It is possible that a single higher education enterprise may operate several campuses. In this instance, a campus master plan would be prepared for each campus. A higher education enterprise may have one educational plan, but if it is a multi-campus operation, the enterprise necessarily would have several master campus plans.

A campus master plan is a combination map of existing physical facilities and proposed physical facilities arranged in some kind of coherent pattern of inter-relationship. This pattern is one best calculated to provide the facilities which will fulfill the purposes, the program goals, and the enrollment objectives of the enterprise. This projection of facility needs represents the minimum capital improvements essential to the accomplishment of the educational plan of the enterprise.

The campus master plan will ordinarily set forth a ten-year projection of facility requirements. These requirements, to be sure, include facilities for instruction, research, and public service, but also facilities for students, and for management and operation of the enterprise. A campus master plan must be comprehensive.

It may well be that a campus master plan will include replacement or rehabilitation of existing facilities. Such replacement or rehabilitation must be clearly shown since

these improvements may be just as vital to the enterprise as the construction of new facilities. Replacement and rehabilitation raise questions of temporary arrangements during the period of demolition and reconstruction. Frequently, some overcrowding may be necessary or some rental of facilities may be possible. The proposed temporary arrangements are an integral part of a campus master plan.

Again it is essential that a campus master plan be formulated in realistic terms. No higher education enterprise can ever expect all the facilities it would like to enjoy. Thus there is necessarily a close correlation between educational plans and a campus master plan. The facility resources at any particular time must be adequate to the educational plan. Otherwise, the educational plan should be adjusted to the anticipated plant resources of the enterprise.

A campus master plan, like an enterprise educational plan, is not a static document. A campus master plan, like an educational plan, should look at least ten years into the future. Periodically, perhaps every two years or every four years at least, both the educational plan and the campus master plan should be updated to take account of changing circumstances, changing ideas, and changing needs.

A campus master plan is more than simply a map. It should include a general statement of the enterprise purpose to be realized by each new facility, a general program of space requirements to be provided by each new facility, and a general

description of building mass and form. All of these separate project proposals are an indispensable part of the campus master plan. It is the various project proposals which provide the basis for capital budgeting for the campus of a higher education enterprise.

The Instructional Program

In order of priority after the educational plan and the campus master plan, the third most important operating document of a higher education enterprise is the instructional program. Unfortunately, the catalogue appears to supply this need at most higher education enterprises, and the usual catalogue is a listing of courses offered by departments as a kind of unordered array without obvious reason.

The instructional program of a higher education enterprise is the total of all individual degree programs provided by the enterprise. Each separate degree program falls under the jurisdiction of a program management level in the enterprise. The authority of program management may be exercised through a collegial group (faculty or faculty committee) or through a dean, but however structured, the authority is important. The authority is to establish a sequence of courses which fulfill the established requirements and accomplish the objectives of a degree program.

For every degree program, there should be a definite

curriculum or sequence of courses. A degree program is a program of specialized study which leads to award of a degree. These degree programs may be at the two-year level (associate degree), baccalaureate level (bachelor's degree), master's level (master's degree), graduate professional level (graduate professional degrees), and doctoral level (doctor's degree).

The one instructional program in a college or university which may or may not result in a degree is the general studies program. Most colleges and universities will provide a general studies program of some scope. There appears to be general agreement that a general studies program is desirable, even though faculties and others have considerable difficulty in defining the objectives of the program and in devising an appropriate curriculum.

A general studies program is often a component part of or a foundation for some other degree program. Thus in technical education programs at the associate degree level, there is expected to be a general studies component providing instruction in knowledge and skills useful as a foundation for particular para-professional competence. Baccalaureate programs in arts and sciences and in professional fields will also have a general studies component or foundation. Thus, a baccalaureate program is not a complete four-year program of courses; it is the specialized part of a baccalaureate program built upon the base of a general studies program.

As we have suggested, a degree program is identified

usually as a degree and a specialization. A degree program would be an Associate in Applied Business in computer programming, an Associate in Applied Science in nursing technology, a Bachelor of Arts in English or mathematics, a Bachelor of Science in pre-medicine or education, a Bachelor of Fine Arts in music or art, a Bachelor of Architecture, a Bachelor of Science in engineering or agriculture, a Master of Arts in economics or French, a Master of Science in chemistry or school administration, a Master of Public Administration, a Juris Doctor in law, a Doctor of Optometry, a Doctor of Philosophy in physics or sociology, a Doctor of Dental Surgery, a Doctor of Veterinary Medicine, a Doctor of Medicine.

For each such degree program, thre is a curriculum prescribed by the program management level of organization in a higher education enterprise. The program management level also supervises the performance of the curriculum. The appropriate parts of each curriculum are assigned to an operating department, with enrollment projections for each course. Program management must therefore maintain a program curriculum register, a record of all courses which may be used to accomplish the purposes of the program.

The existence of a certain number of so-called "electives" in a program curriculum complicates the maintenance of a program curriculum register. In many programs the student is offered a certain number of optional course credits for which

he may make a free selection of courses. Presumably this option is provided the student in order that the student rather than the faculty may decide what supplementary courses are of primary interest to him. Presumably, also, this option affords the student an opportunity to enroll in courses which complement rather than repeat the instruction which the student has had in high school. The assumptions about electives should be reviewed carefully by program managers and their validity fully established. In many instances, it may be desirable to provide "electives" within a limited range of choice.

For every program there are enrollment expectations. These enrollment expectations may be based upon projections of experience as modified by admissions practice. To be sure, it is possible that few, if any, persons will present themselves as candidates for admission and enrollment in some particular instructional program. Sometimes admission may entail an active endeavor to recruit students for a certain program. Sometimes admission may have to be cut off for some programs while remaining open for other programs.

It is essential that enrollment capacity be established for every instructional program, and that enrollment not exceed such capacity. To enroll students in an instructional program beyond enrollment capacity is unfair to the student; indeed, such action is a form of fraud and deceit.

A classification of instructional programs has been set

forth earlier. Within such a classification scheme, the enterprise as a whole should prepare its roster of instructional programs. This roster, which is more than a catalogue of courses, would contain a complete listing of all the degree programs provided by the enterprise. Without such a roster of instructional programs, the enterprise lacks a program upon which to base its budget requirements.

Other Programs

The instructional program is obviously not the only program involved in the operation of a higher education enterprise. There are other programs as well to be brought together. At a minimum, each higher education enterprise should have five other program documents besides the instructional program.

First, there might be a combined research and public service program document, or roster, of all the individual research projects and all individual research projects and all individual public service projects to be operated by a higher education enterprise in a budget period. This document would constitute the approved separately budgeted research and separately budgeted public service projects to which the enterprise is committed.

Secondly, there should be an auxiliary services program document setting forth the specific performance objectives for the student health service, the residence hall service, the

student center, intercollegiate athletics, and other services. It is highly desirable to have program goals for each of these services as a basis upon which to build their budget needs.

In the third place, there should be an instructional support document, consisting of a library program, an instructional services program (audio-visual, broadcasting, etc.), and departmental support program. This last part of the instructional support program should set forth the standards for departmental staffing other than faculty staffing.

In the fourth place, there is a need for a student aid document setting forth the categories of financial assistance to be provided students and the total number of students to be assisted by these various categories.

In the fifth place, there should be an enterprise operating program setting forth the objectives in the work to be performed in student affairs, planning, budget and finance, general services, plant operation, public information and development, and general administration.

It may be added that all such program documents should be prepared on either an annual or biennial basis.

Operations

At the operating level of the higher education enterprise there must be a work program. This means essentially that each academic department or other academic unit must prepare a

definite work performance document setting forth two things: (1) the work to be accomplished in a given year in terms of student credit hours to be produced, and (2) the technology or work process to be employed in this production.

An academic department will have a course roster, a listing of all course offerings as approved for each program in which the department participates. This course roster will show the student credit hour enrollment for each course in each program as projected by program management. In addition, for each course the technology will be shown primarily by means of the staffing requirements for each course: the number of senior faculty members (professor, associate professor, and assistant professor) per student credit hours supplemented by the number of faculty assistants (teaching assistant, laboratory assistant, and course assistant) per student credit hours.

Only when each academic department has such an operations work plan can it lay claim to adequate preparation for carrying out its academic role in various instructional programs.

The Capital Improvements Six-Year Plan

The campus master plan and a projection of space needs are, of course, the basis for preparing a six-year capital improvements plan. This plan sets forth the actual projects which a higher education enterprise must undertake to construct in order to provide the necessary physical facilities

with which to achieve its educational goals. Because of the lead-time involved between the start of detailed planning for a project and occupancy of the structure, the six-year plan is, in fact, a projection of facility needs about ten years beyond the time when the plan is formulated.

Physical facilities are essential to the performance of educational programs. The need for such facilities, however, depends in large part upon certain policy choices, upon plant utilization standards, and upon space standards. The extent to which a higher education enterprise seeks to provide research space in conjunction with instructional space is a policy choice. The extent to which an enterprise seeks to house its student enrollment is a policy choice. The extent to which an enterprise seeks to provide student service facilities is a policy choice. These decisions determine plant needs.

Standards of space utilization and of space need also influence the demand for physical facilities. Obviously the more hours per week existing and projected instructional facilities can be scheduled for use, the less demand there will be for total instructional space. The more carefully developed the space standards per student station for classroom and laboratory facilities, the space standards for faculty offices, the space standards for library seating and book storage, and the space standards for other space use, then the less likelihood there is for waste or unutilized space.

A capital improvements six-year plan must be carefully

evaluated in terms of the reasonable prospects for financing the desired number and magnitude of projects. If the magnitude of the plan exceeds reasonable expectations of financing, alternative adjustments in the educational plan of the enterprise must be formulated.

The Capital Improvements Two-Year Program

The capital improvements two-year program is the budget recommendations of a higher education enterprise for capital improvements projects to be incorporated in the capital improvements appropriation of state government or in the current financing program of the board of trustees. The projects included in a two-year program are those from the six-year plan for which there is the greatest immediate urgency.

The facilities projects making up the two-year program are necessarily those for which careful advanced planning has already proceeded through the initial stages. These initial stages include:

1. The educational program concept in detail
2. The proposed site
3. The site development needs in relation to utilities, drainage, soil condition, traffic, general orientation to campus
4. The architectural concept
5. Estimated cost by

a. Site

b. Site development

c. Building

d. Equipment

e. Architectural service

f. Contingencies

Current Operating Budget

The current operating budget of a higher education enterprise should be divided into five component parts, each part representing a major activity area of operations. These five component parts would be:

1. Instruction and General
2. Research
3. Public Service
4. Auxiliary Services
5. Student Aid

For the enterprise as a whole, there needs to be a summary of income and expenditure as shown in the exhibit herewith. This kind of summary can only be constructed upon the basis of much detailed preparation of budget estimates and accounting records.

Here we shall concentrate our attention upon the budget preparation for instruction and general operation. On a program basis, such budget must be prepared in accordance

with the programs offered by the enterprise. These programs can be brought together under the following program categories:

1. General Studies
2. Technical Education
3. Baccalaureate in Arts and Sciences
4. Baccalaureate in Professional Studies
5. Master's Degrees
6. Graduate Professional Degrees
7. Doctoral Degrees

Because of the peculiar budgetary requirements of medical programs, it is desirable to separate out these programs from the graduate professional category and so have an additional program grouping:

8. Medical Degrees

There may be as many as 15 component parts in the grouping of Baccalaureate in Professional Studies, and there may be four or five component programs in the category of Graduate Professional Degrees. Needless to say, a program budget must be prepared for each component program and not just the category groupings alone.

For each component degree program offered by the enterprise, the essential data include program output and program technology. The program output would be presented as:

1. Total Student Credit Hours to be Produced

The program technology would be presented as follows:

1. Faculty work load: student credit hours per faculty member
2. Instructional assistance work load: student credit hours per teaching assistant
3. Faculty support personnel per student credit hour
4. Average faculty salary
5. Average teaching assistant salary
6. Average faculty support salary

Upon the basis of these output data and standards of instruction, an instructional budget can be constructed along these lines:

1. Faculty instruction (number of faculty X average salary)
2. Faculty assistance (number of teaching assistants X average salary)
3. Faculty support (number of faculty support personnel X average salary)
4. Fringe benefit costs.

Departmental instruction expense, of course, includes other items besides personnel costs. These other items include:

5. Supplies and equipment
6. Travel and other
7. Program management

The amounts budgeted for these various parts of Departmental Instruction and Research will necessarily reflect

determinations based upon judgments about desirable practice within available income limitations.

The entire budget of a higher education enterprise for Instruction and General operation would include these seven component groupings:

1. Departmental Instruction and Research
2. Instructional Services
3. Libraries
4. Student Services
5. General Expense
6. Plant Operation
7. Administration

For each of these account groupings in addition to departmental instruction, there will be personnel service expense and other expense. When these budgeted requirements are divided by total full-time equivalent students, we have a statement of projected expense in each account grouping per student.

The direct expense of Instruction and General operation -- the first three items above -- are usually expected to amount to about 65 percent of the total expenditures for this activity area of a higher education enterprise. About 35 percent will be required for the overhead expense of the enterprise (student services, general expense, plant operation, and administration).

Integration of Income and Expenditure

It is essential in program budgeting, indeed in all budgeting, that income be provided for all expenditures. On a current operating basis, income for Instruction and General operation of a higher education enterprise may be derived from these sources:

1. Transfers from reserves
2. Subsidies from government
   a. federal
   b. state
   c. local
3. Charges
4. Endowment income
5. Gifts
6. Other income

For Instruction and General operation, a summary of expenditures would include:

1. Operating expense
2. Transfers to Research
3. Transfers to Public Service
4. Transfers to Auxiliary Services
5. Transfers to Student
6. Transfers to reserves

General

It is necessary to have detailed and summary budgets of operating expense for the research area, the public service area, the auxiliary services area, and the student aid area of a higher education enterprise. It is also necessary for each of these areas of activity to have also a summary of available income and of expenditure. This summary of income would include transfers from general income in addition to the other categories of income just outlined above. The summary of expenditure would include operating expense and transfers to reserves.

Only a program budget provides information about higher education output and the expense of various program components of a higher education enterprise. Only a program budget clearly reveals the fiscal facts of higher education. Only a program budget permits effective budget management of a higher education enterprise.

UNIVERSITY A

	Actual 1969-70			Estimated 1970-71			Projected 1971-72			Projected 1972-73		
	Income	Expense	Net	Income	Expense	Net	Income	Expense	Net	Income	Expense	Net
Instruction and General	$24,250,000	$20,800,000	$3,450,000	$25,750,000	$22,750,000	$3,000,000						
Research	600,000	700,000	(100,000)	650,000	750,000	(100,000)						
Public Service	1,400,000	1,700,000	(300,000)	1,400,000	1,700,000	(300,000)						
Auxiliary Services	12,500,000	12,000,000	500,000	13,250,000	12,750,000	500,000						
Student Aid	1,000,000	3,500,000	(2,500,000)	1,000,000	3,750,000	(2,750,000)						
Total	$39,750,000	$38,700,000	$1,050,000	$42,050,000	$41,700,000	$ 350,000						